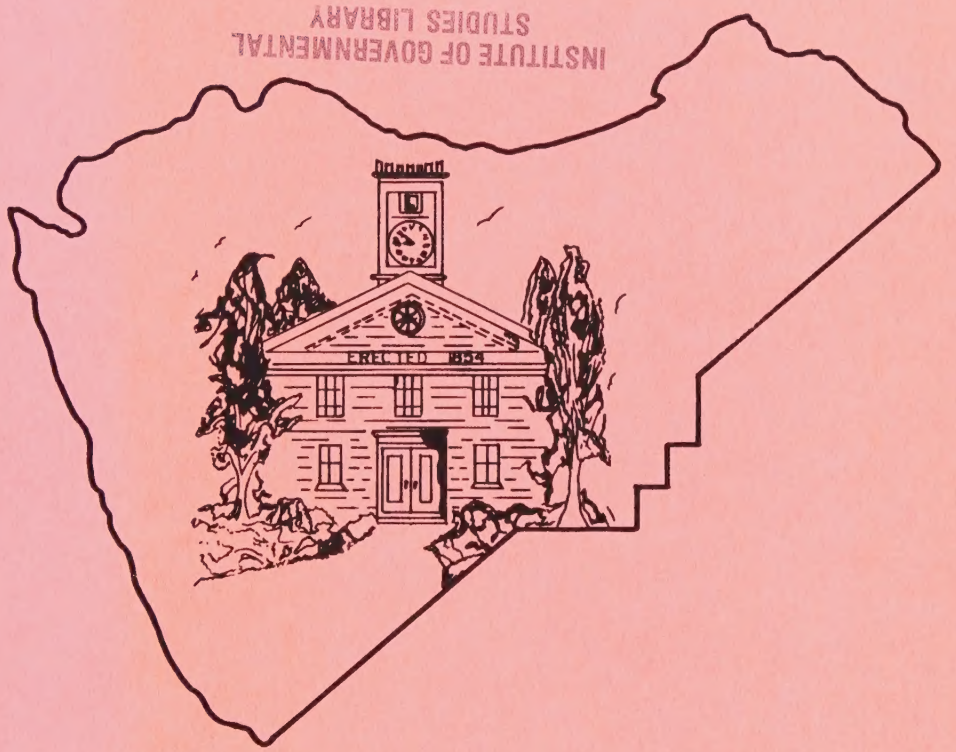
MARIPOSA COUNTY

GENERAL PLAN



DOCUMENT III

TECHNICAL

AND

DATA APPENDIX

ACKNOWLEDGEMENTS

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This report was financed in part through a "701" Comprehensive Planning Grant from the U. S. Department of Housing and Urban Development administered through the State Department of Housing and Community Development and through the State Environmental Information Grant Program (AB 2560).

DOCUMENT III

MARIPOSA COUNTY GENERAL PLAN AND MASTER EIR

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MARIPOSA COUNTY GENERAL PLAN
AND
MASTER ENVIRONMENTAL IMPACT REPORT
DATA APPENDIX

1.000 INTRODUCTION AND PURPOSE

The following sections contain data and documentation to support the various conclusions drawn in the General Plan (Document I) and Master Environmental Impact Report (Document II). As supportive data, this document is subject to upgrading and refinement as updated information is developed or obtained. In this respect, Document III is subject to the specific policies and standards found in Section 1.303 and 2.505 of the General Plan (Document I).

Some sections of this document have not been completed due to the unavailability of information such as the 1980 census. As this information is available these reserved sections will be completed; Other sections which utilize estimates or projections to derive 1980 census figures will be revised.

2.000 SOCIO-ECONOMIC INDICATORS

The following sections of this document provide primary data on the socio-economic characteristics of the residents of Mariposa County. It should be understood by the reader that Mariposa, being a rural county with a small population, has only a very limited amount of primary data available on its population. This situation requires that an analyst utilize a number of data sources that do not necessarily correspond to each other. In order to present information in a meaningful manner, a considerable amount of interpretation is necessary. This section addresses the primary subject headings of population characteristics, population income and employment.

2.100 Population Characteristics

2.101 Population Growth

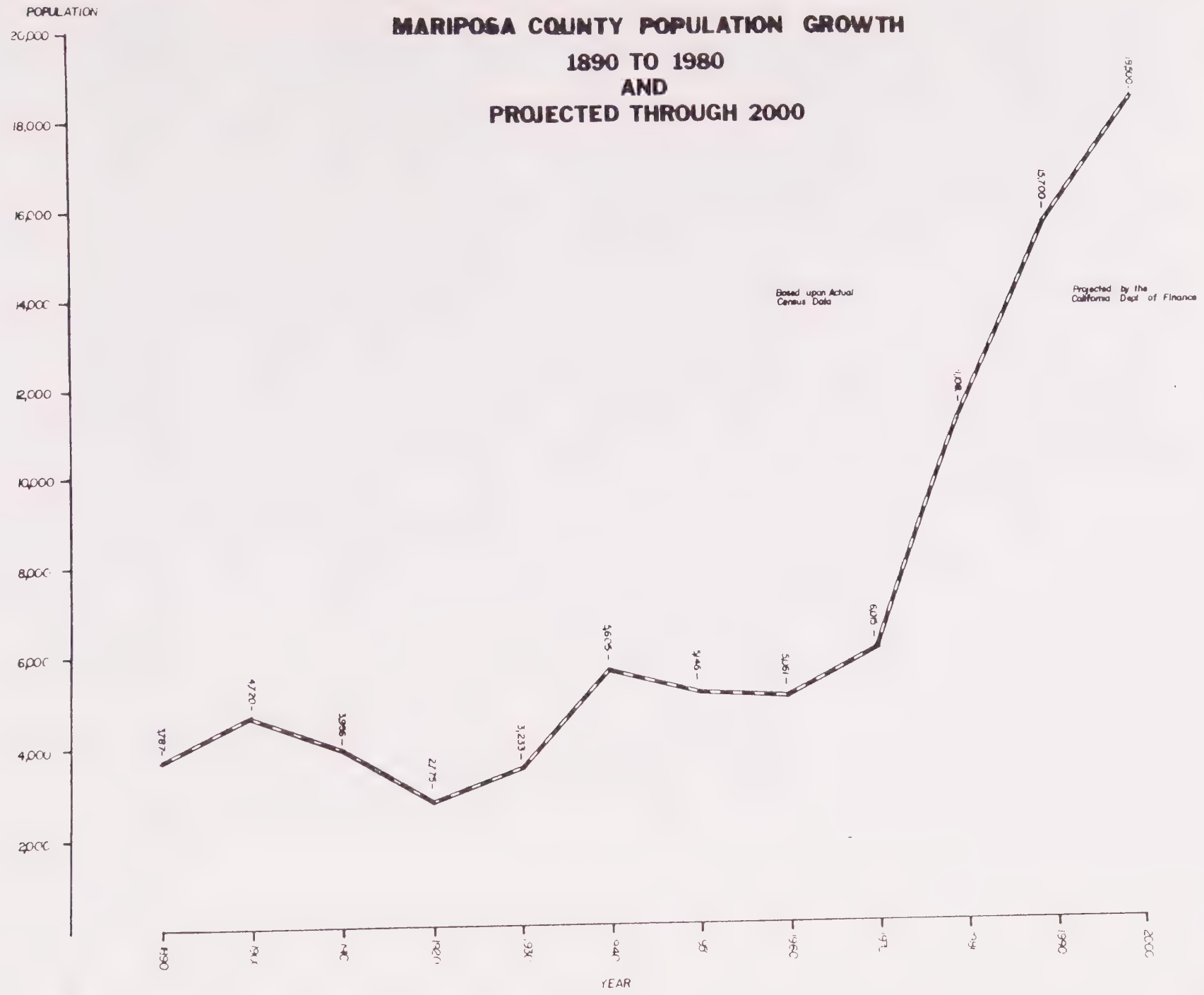
Although Mariposa, as a county, was formed in early 1850 useful census data is not available until 1890. At this period in the history of the county the gold rush had run its course and county boundaries approximate the present boundary lines. Exhibit 2-A generally describes the population levels of the county over the past 100 years and the estimated population level for the years 1990 and 2000.

From 1890 to 1970 the population level fluctuated between 2,700 and 6,000. Variations were due primarily to the mining activity of the county through 1950. During World War II most of the remaining mines in the County were shut down. The population declined in the 1950 census and growth did not reoccur until 1970 when recreation and retirement development started to occur. This growth rate accelerated through the 1970's and is expected to continue through the year 2000.

The growth rate of the county from 1970 to 1980 was 84.7%. During this period 5,093 new residents were added to the existing 6,015 population. During this same period the birth rate and death rates in the County were nearly equal and the growth is assumed to be 100% due to inmigration. This assumption is some what substantiated by the 1975 special census conducted by the Dept. of Finance wherein it was found that 51.6% of those responding, or 1,592 households, indicated that they lived at some other address outside of the County prior to 4/1/70. Using average household population in 1975 of 2.35 people, this amounted to 3,741 new residents in a five year period or roughly 154% of the total growth of the County. Due to the fact that some of the existing residents moved out of the county since 1970 and it is assumed that many new residents were retired with smaller than average households, this figure exceeded 100%.

The growth of Mariposa County's population over the past 20 years has not been equally distributed throughout the county. Table 2.1 below shows the relative population distributions for the three county census division from 1960 to 1980. The period of 1960 to 1970 show the major portion of the County's growth take place in Yosemite and Coulterville. Between

EXHIBIT 2-A


MARIPOSA COUNTY POPULATION GROWTH
1890 TO 1980
AND
PROJECTED THROUGH 2000
POPULATION
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
Based upon Actual Census Data
Projected by the California Dept of Finance
YEAR
2000

1970 and 1980 the Yosemite population declined while the Coulterville and Mariposa census divisions experienced a rapid growth rate.

Table 2.2 attempts to evaluate future growth trends throughout the County based upon recent development trends. While these projections (which are based upon building permit activity for a relatively short period of time) may not be adequate for long term policy use, they give some indication of future population distributions given present development trends. In conclusion, it seems highly probable that significant population growth will continue to occur in the Mariposa and Coulterville census divisions. We can expect the major population concentration in the County to be located in the area east of the townsite of Mariposa to the Sierra National Forest boundary between Triangle Road and Highway 49 South. Furthermore, if present trends continue, Nearly 60% of the total county population will most likely be located within a fifteen mile radius of the Mariposa townsite. Although significant growth has, and will continue to, occur in the Coulterville-Greeley Hill-Don Pedro area (Coulterville Census Division) this growth will not take place at the same rate expected in the Mariposa Census Division. Given present Park Service planning policies for Yosemite, the Yosemite Census Division can be expected to further decline in population in future years.

2.102 Population Age and Sex

As might be expected, Mariposa County has a large number of senior residents. According to the 1975 Special Census, the median age in the county was 32 for males, 34 for females with a 33 average for both sexes. According to the 1970 census, the median age in Mariposa County was 37.3 compared to a 28.1 median age for the state. Mariposa County had the 5th highest median age in the state in 1970. The 1970 versus the 1975 figure indicates that the county's median age is becoming younger with increased growth. This assumption is supported by school enrollment growth figures.

Table 2.3 shows the estimated 1980 population by sex and age group. These estimates indicate that our dependent populations, under 18 and over 60 years old, represent 46.35% of the total population. Roughly 23.6% of the total 1980 population is under 19 years of age while 22.7% of the total population is over 59 years of age. This high percentage of dependent populations has major implications with respect to public service demands such as schools, recreation facilities, health care facilities and services, etc.

The distribution of these dependent populations throughout the county is not uniform. As might be expected, Yosemite has the lowest median age in the county ranging from a low of 21 in the eastern portion of the valley to a high of 28 in the El Portal area. This area, with roughly 18.8% of the 1975 county population, had nearly 10.9% of the County 18 and under population and only 2.5% of the County population 65 years old or older. Mariposa on the other hand has the largest concentration of people 60 years old or older. Nearly 23% of the Mariposa Town area population is 60 or over which represents nearly 17.7% of the total 60+ population of the county. The Mariposa town area also contains a large percentage of the 18 and under population.

TABLE 2.1

MARIPOSA COUNTY CENSUS DIVISIONS - GROWTH

1960 Through 1980

	1960	1970 (% Change)	1980 (% Change)
County Total	5,064	6,015 (+ 18.78%)	11,108 (+ 84.67%)
Yosemite Division	1,090	1,420 (+ 30.28%)	1,334 (- 6.06%)
Coulterville Division	570	719 (+ 26.14%)	1,531 (+112.93%)
Mariposa Division	3,404	3,876 (+ 13.87%)	8,243 (+112.67%)

TABLE 2.2

MARIPOSA COUNTY PLANNING AREA

POPULATION PROJECTIONS

1980 - 2000

Planning Area	Estimated 1980 Population	Estimated 1980 % of Total Population	Projected 1990 Population	Projected 1990 % of Total Population	Projected 2000 Population	Projected 2000 % of Total Population
Bear Valley	181	1.6%	251	1.6%	259	1.4%
Bootjack	2,572	23.2%	4,255	27.1%	5,439	29.4%
Bridgeport	644	5.8%	1,005	6.4%	1,221	6.6%
Mt. Bullion	287	2.6%	408	2.6%	481	2.6%
Catheys Valley	524	4.7%	722	4.6%	869	4.7%
Chowchilla	165	1.5%	361	2.3%	499	2.7%
Coulterville	308	2.8%	377	2.4%	426	2.3%
Don Pedro	357	3.2%	785	5.0%	1,110	6.0%
El Portal	597	5.4%	1,413	9.0%	1,313	7.1%
Greeley Hill	668	6.0%	848	5.4%	962	5.2%
Hornitos	199	1.8%	235	1.5%	259	1.4%
Hunters Valley	74	.7%	204	1.3%	296	1.6%
Kinsley	28	.3%	47	.3%	56	.3%
Mariposa	1,555	14.0%	1,680	10.7%	1,702	9.2%
Midpines	696	6.2%	1,005	6.4%	1,221	6.6%
Ponderosa	513	4.6%	957	6.1%	1,276	6.9%
White Rock	110	1.0%	157	1.0%	185	1.0%
Yosemite North	1,375	12.4%	691	4.4%	611	3.3%
Yosemite South	247	2.2%	298	1.9%	315	1.7%
Total	11,100	100%	15,700	100 %	18,500	100 %

TABLE 2.3

ESTIMATED

MARIPOSA COUNTY

POPULATION AGE STRUCTURE

	Estimated 1980*			
Age Group	Male	Female	Total	%
0-13	858	847	1,705	15.35%
14	72	72	144	1.30%
15	81	72	153	1.38%
16	90	90	180	1.62%
17	99	99	198	1.78%
18	127	118	245	2.21%
19	136	109	245	2.21%
20	144	99	243	2.19%
21	126	91	217	1.95%
22	108	109	217	1.95%
23-24	198	186	384	3.46%
25-34	757	674	1,431	12.88%
35-44	750	705	1,455	13.10%
44-49	280	268	548	4.93%
50-54	280	276	556	5.00%
55-59	307	356	663	5.97%
60-64	320	380	700	6.30%
65+	848	976	1,824	16.42%
Total	5,581	5,527	11,108	100.00%

*estimate based upon EDD estimated age ratios and utilizing actual 1980 total census counts. (Not actual 1980 census data)

Outside of these areas, the ratios of population groups in various age categories is average at about 25.3% 18 years or under population and 14% of the 65+ group. The areas exhibiting the highest median age are Bear Valley (49), Coulterville (47), the western portion of Bootjack and Mariposa (44), Mt. Bullion (40) and Greeley Hill (39). None of these areas, except for Mariposa and possibly Greeley Hill, represent significant population concentrations.

Under most circumstances, when male-female ratios are studied in areas with older populations, there is a higher percentage of females than males. In Mariposa, however, there are a few more males than females. Generally speaking "normal" female to male ratios occur at the 50 and over age grouping. Between 18 and 50 however there are significantly more males than females. In this age category 47.3% of the population is female and 52.7% is male. This is probably due in large part to the large number of males in Mariposa County employed in government agencies such as the U.S. Forest Service, Park Service and California Division of Forestry. Due to the seasonality of these types of employment opportunities and the large number of people employed both in seasonal government and tourist services enterprises, significant variations can be expected in both male-female ratios and age groupings. The seasonal variations will be exceedingly pronounced in the Yosemite area between the winter months and the summer months.

2.103 Racial Characteristics

Unlike many areas of California, Mariposa County has a rather homogeneous population with regards to racial make up. Table 2.4 illustrates the relative percentages of the major race groupings used by the census and their changes between 1970 and 1980. The white population percentage declined from 95.7% to 93.9% from 1970 to 1980. This decline is most likely the direct result of improved census techniques rather than inmigration or a high fertility rate of any particular racial group. This assumption is somewhat substantiated by the growth of the "other races" category from .3% in 1970 to over 1.7% in 1980. By far the largest single non-white racial group is American Indian with 3.2% of the population. Mariposa County also has a large number of individuals of Spanish origin (4.5% of the total population) many of whom may also be included in the American Indian racial group.

The largest percentages of the county's minority populations are found in the Yosemite Valley and at the Mt. Bullion Conservation Corp Camp near Mariposa.

2.104 Household and Family Structure

Primary information on family organization and family size in Mariposa County is compiled from 1970 census data. The information contained in this section should be utilized with some discretion due to the 84.7% growth that has taken place in the County since this data was compiled.

TABLE 2.4

MARIPOSA COUNTY POPULATION

BY

RACE AND SPANISH ORIGIN

1970 and 1980

	1970(1)		1980(2)	
	Number	Percent	Number	Percent
Total Population	6,015	100%	11,108	100%
White	5,756	95.7%	10,431	93.9%
Black	30	.5%	72	.6%
Amer. Indian	201	3.3%	357	3.2%
Asian	11	.2%	55	.5%
Other Races	17	.3%	193	1.7%
Spanish Origin(3)	Not Available		504	4.5%

(1) Table 34, Vol. 1, Part 6, Section 1, Characteristics of the Population - U.S. Dept. of Commerce Bureau of the Census.

(2) Population by Race and Spanish Origin published by the State Census Data Center (3/31/81) page 1.

(3) Spanish origin data not available on Table 34 (referenced above) In 1980 data, persons of Spanish origin counted regardless of race, for this reason inclusion of this category results in a figure exceeding 100% of population.

as updated information becomes available from the 1980 census, this section will be revised.

There are two primary terms utilized in census counts to describe this issue, the first term is "family" which generally denotes a household head and one or more other persons living in the same household who are related to the head of the household by blood, marriage or adoption. The second common term is "household" which includes all persons who occupy a group of rooms or a single room which constitues a house unit. In short, a household may be counted as a family if there is more than one person and they are related by blood, marriage or adoption. All families are households but not all households qualify as families.

According to the 1970 census, there were 5,725 people living in households, 95.18% of the total population. The average household population was 2.60 persons or a total of 2,204 households. Of these 2,204 households, 1,606 or 72.87% were classified as family units. Average family size is larger than the average household size at 3.19 people per family. The following tables give the general characteristics of the average household and family units in Mariposa County. Due to the relatively few minority populations in Mariposa County, family characteristics by racial group is not generally available. In summary, it would appear that Mariposa County has a very "traditional" household and family composition as might be expected in an "older" population.

2.105 Education

As in Section 2.105, this section relies heavily upon 1970 census data and should be used with some discretion in light of the county's growth over the past 10 years. Table 2.8 below gives the average educational background for persons 25 years old or older. The average number of school years completed is equal to the state average during 1970.

TABLE 2.5

MARIPOSA COUNTY

AGE OF HEAD OF HOUSEHOLD
AND FAMILY & HOUSEHOLD HEAD BY SEX

Household Head Age	Number	Percent of Total
14 to 24 Years	99	4.49%
25 to 34 Years	307	13.93%
35 to 44 Years	326	14.79%
45 to 64 Years	829	37.61%
65 and Over	613	29.13%
Total	2,204	100.00%
Primary Individual (Household):		
Male	330	55.18%
Female	268	44.82%
	598	100.00%
Family Head:		
Male	1,520	94.65%
Female	86	5.35%
	1,606	100.00%

TABLE 2.6

MARIPOSA COUNTY

FAMILY COMPOSITION

Family	Number	Percent of Family Pop.
Total Families	1,606	N/A
Total Family Population	5,127	N/A
Head of Family	1,606	31.32
Wife of Head	1,472	28.71
Child of Head	1,748	34.00
Other relative of Head	181	3.53
Not related to Head	120	2.34
Average Family Size	3.19 People	

Average Family Composition	
Head of Family	1 Person
Wife of Head	.92 Person
Child of Head	1.09 Persons
Other relative of Head	.11 Person
Not related to Head	.07 Person
Total	3.19 Persons

TABLE 2.7

FAMILY COMPOSITION

AGE OF CHILDREN

Family Category	Number	Percent of Total
TOTAL FAMILIES	1,606	N/A
With Children Under 18	670	41.72%
With Children Under 6	282	17.56%
Without Children under 18	936	58.28%
HUSBAND WIFE FAMILIES	1,472	91.66% of all Families
With Childred Under 18	600	40.76%
With Children Under 6	270	18.34%
Without Childred under 18	872	59.24%
FEMALE HEADED FAMILIES	86	5.35% of all Families
With Children under 18	44	51.16%
With Children under 6	11	12.79%
Without Children under 18	42	48.84%

TABLE 2.3

MARIPOSA COUNTY

EDUCATIONAL LEVEL BY SEX
OF PERSONS 25 YEARS OLD OR OLDER

Education Category	Male 25 years old or older	Male % of Total	Female 25 years old or older	Female % of Total
No. Elementary Year Completed	4	.21%	12	.65%
Elementary School: 1 to 4 years	72	3.78%	21	1.14%
5 to 7 years	139	7.29%	106	5.73%
8 years	301	15.79%	166	8.97%
High School: 1 to 3 years	387	20.30%	462	24.96%
4 years	558	29.28%	646	34.90%
College: 1to 3 years	230	12.07%	273	14.75%
4 years or more	215	11.28%	165	8.90%
Median School Years Completed	12.1	N/A	12.2	N/A
Percent High School Graduates	N/A	(52.6)	N/A	(58.6)
Total	1,906	100.00%	1,851	100.00%

2.106 Low Income Households and Populations

Primary information on low income or poverty level populations in Mariposa County is based upon 1970 census data. The information in this section should be utilized with some discretion given the rapid growth of the county over the past 10 years. The 1970 census indicates that approximately 11.5% of all the families in the county had incomes below poverty level. At the same time over 11% of all county families had incomes of $15,000 or more. This compares with a state-wide median family income of $10,732 and a county median family income of $7,752 during 1970. The overall poverty level rate for families state-wide during 1970 was 8.4% and 11.8% for rural non-farm areas of the state. By comparison, the state-wide average for families with incomes of $15,000 or more was 26.7% and 18.7% for rural non-farm areas of the state.

In summary, Mariposa County is about average for a rural non-farm area in the numbers of poverty level families. Family incomes as a whole however fall far below state and even rural non-farm averages. This issue will be further discussed in Section 2.200 of this document.

The following tables, compiled from the 1980 census and Employment Development Department estimates, give some indication of the characteristics of Mariposa County's low income population. Table 2.9 describes family and individual poverty level concentrations and indicates that while the numbers are rather small, 40.7% of all Female Headed Families and 70.5% of all Female Headed Families with Children under 18 years of age, had incomes below the poverty level. In real numbers however, there were only 35 poverty level female headed households, 31 of which had children under 18 years of age.

Table 2.10 describes the projected 1981 distributions of poverty level individuals in the County (by 1981 poverty income levels) by age grouping. These figures reveal some trends which are not easily explained. For instance, there are significantly higher ratios of the male population between the ages of 14 and 44 years old that live below the poverty level. This factor may be explained by the seasonal employment opportunity characteristics of jobs available to young men in Mariposa. There is a marked increase in the ratio of poverty level women between the ages of 45 and 54 which exceeds the male ratios for this age group. The highest concentrations, in both sex groupings, appears in the 55 and older category. Over 54% of the entire projected county population that lives below the poverty level is over 55 years of age. In relative terms, this is approximately 11.9% of all persons projected in Mariposa County over 14 years of age compared to a 13.3% rate of persons living below the poverty level in 1970. The rather large number of projected proverty level senior citizens in the county may in part explain the figures of a 30.9% poverty rate for unrelated individuals described in Table 2.9.

As stated earlier, these figures are based upon 1970 census data. With the development and implementation of many senior assistance programs since 1970, these figures may be significantly reduced when 1980 census data becomes available.

TABLE 2.9

MARIPOSA COUNTY

POVERTY CATEGORY BY FAMILY ORGANIZATION

Category	75% Poverty Level Number	75% % of Total	Poverty Level or Less Level Number	Poverty Level or Less % of Total	125% Poverty Level Number	125% % of Total
Households	N/A	N/A	185	14.7%	N/A	N/A
Families	101	6.2%	187	11.5%	278	17.1%
With Children Under 18 years	N/A	N/A	83	12.4%	N/A	N/A
With Female Heads of Household	11	12.8%	35	40.7%	44	51.2%
With Female Head and Children under 18	N/A	N/A	31	70.5%	N/A	N/A
Male Family Head 65 years old or older	N/A	N/A	95	14.8%	N/A	N/A
Unrelated Individuals	180	21.6%	258	30.9%	347	41.6%
Persons	397	6.7%	777	13.3%	1,198	20.3%

TABLE 2.10

MARIPOSA COUNTY

PROJECTED 1981 POPULATIONS AND
PERSONS BELOW PROVERTY LEVEL BY AGE & SEX*

	Male			Female			Total	
Age Group	Tot. Pop.	Persons below Poverty Level	% of Total	Tot. Pop.	Persons below Poverty Level	% of Total	Persons below Poverty Level	% of Total
14 to 21 years	970	70	7.22%	830	40	4.82%	110	8.87%
22 to 44 years	2,010	130	6.47%	1,840	190	1.03%	320	25.81%
45 to 54 years	610	50	8.20%	590	90	15.25%	140	11.29%
55 to 59 years	340	110	32.35%	390	50	12.82%	160	12.90%
60 to 64 years	360	80	22.22%	420	70	16.67%	150	12.20%
65 plus years	940	150	15.96%	1,080	210	19.44%	360	29.03%
Total	5,230	590	11.28%	5,150	650	12.62%	1,240	100.00%

*As projected by the State of California Health and Welfare Agency Employment Development Department, Employment Data and Research, Northern Area Labor Market Information Group.

2.200 POPULATION INCOME

2.201 Per Capita Income

As discussed in Section 2.106, Mariposa was typical of rural non-farm areas in the state with respect to low income households in 1970. On the other hand, Mariposa County was far below state averages in 1970 for families with above normal incomes. Table 2.11 below shows the actual and estimated per capita incomes for Mariposa County from 1970 to 1980.

TABLE 2.11

MARIPOSA PER CAPITA INCOME

1970 to 1980 (Estimated State Dept. of Finance)

Year	Per Capita Income	Household Pop.	Average Household Income
1970	$2,819*	2.6 People	$7,329
1975	$4,887	2.35 People	$11,485
1976	$5,262	N/A	N/A
1977	$5,538	N/A	N/A
1978	$6,314	N/A	N/A
1979	$6,928	N/A	N/A
1980	$7,603	2.48 People	$18,855

*1970 census estimate, Dept. of Finance figures was $3,913 for 1970.

The 1980 estimated per capita income for Mariposa County has increased over 185% from the 1970 Dept. of Finance figures.

2.202 Household Income

Until 1980 census figures are available, there is little data available on average household incomes that is not over 10 years old. Table 2.12 below attempts to update family income distributions utilizing per capita income projections by the State of California for 1980 and income distributions for 1970. Although these figures can at best only provide approximations of 1980 income distributions, they give some indications as to how 1980 census figures may appear.

TABLE 2.12

MARIPOSA COUNTY HOUSEHOLD INCOME

1980-Estimated

Household Income Range	Projected Number of Households	Percent of all Households
Less than $5,400	281	6.782%
$5,400 to $10,797	533	12.885%
$10,798 to $16,197	692	16.708%
$16,198 to $21,597	648	15.660%
$21,598 to $26,997	533	12.885%
$26,998 to $32,397	503	12.145%
$32,398 to $40,497	495	11.961%
$40,498 to $67,497	429	10.358%
$67,498 or higher	26	.616%
Total	4,140	100.000%

The median household income for Mariposa County, based upon projected growth in per capita income, is estimated to be between $13,583 (185% of 1970 census figure) and $18,855 (based upon 1980 estimated household size and per capita incomes). Based on Table 2.12 above estimates, nearly one third of all 1980 households have incomes between $10,798 and $21,597 per year. Nearly one-fifth of the households have incomes below $10,798 and only 11% have incomes above $40,497 per year. These figures, given growth in the consumer price index for the past ten years, tend to support the theory that overall income distributions have not dramatically changed in the decade of the 70's. We expect that 1980 census data, when available, will indicate that we have maintained about the state-wide average for poverty level households and that we will fall substantially below state norms for households with above average incomes.

2.203 Wage and Salary Income

Reserved - Current Data is not Available.

2.204 Transfer Payment Income

As might be expected with a county having a high percentage of people in the 65+ age category and with a great deal of seasonal unemployment, Mariposa County has a substantial number of residents receiving federal transfer payments. Although actual dollar amounts are not available, numbers of individuals receiving Social Security and welfare benefits are available for 1979. While dollar amounts of Social Security payments are not available for 1979, the Social Security Administration reports that average monthly payments for SSI and Social Security in Mariposa County during August of 1981 amounted to annual receipts of over $6.3 million. Table 2.13 below describes the participation in these two transfer payment programs.

TABLE 2.13

MARIPOSA COUNTY

SOCIAL SECURITY AND WELFARE ASSISTANCE

PARTICIPATION FOR 1979

Assistance Category	Number of Participants	% of Population
Social Security	2,159	21.9%
0-64	687	8.3%
65 and over	1,472	93.8%
Aid to Families with Dependent Children	499	5.1%
16 Years or over	200	N/A
Food Stamps	718	7.3%

As described on Table 2.13 above, nearly 22% of all county residents received Social Security benefits during 1979. These figures, in conjunction with welfare recepients, indicate a substantial portion of the county's population are receiving Federal transfer payments. Additionally, many local residents received retirement or pension incomes. There is no information available on the number of individuals receiving this type of income.

2.300 EMPLOYMENT

2.301 Labor Force

Comparisons between labor force estimates by the California State Employment Development Department and population estimates by the State Department of Finance indicate that approximately 40% of the county's population is considered in the labor force. Table 2.14 below shows projected 1980 labor force estimates by sex and age group. Percentage figures are also developed for the ratios of people in the labor force compared to the total estimated male and female populations in that age group.

In summary, approximately 24% of the total county labor force is under 25 years of age and 10% is 60 years old or older. Other age groupings yield nearly 21% for the 25-34 age group, 22% for the 35 to 44 age group and 23% for the 45 to 59 age group.

2.302 Employment by Occupation

Exhibit 2-B shows the nine year trend of various employment sectors as percentages of total employment. Over all, the services category has represented between 40% and 45% of all county employment opportuniites.

MARIPOSA COUNTY

Estimated 1980 Labor Force
by Age, Sex and Percent of Population

TABLE 2.14
Estimated Labor Force - 1980*

Age Group	Male Number	% of Tot. Pop. in Age Group	Female Number	% of Tot. Pop. in Age Group	Total Labor Force	% of Labor Force
16	29	32.22%	20	22.22%	49	1.09%
17	49	49.50%	39	39.39%	88	1.96%
18	68	53.54%	59	50.00%	127	2.83%
19	78	57.35%	68	62.39%	146	3.25%
20	88	61.11%	60	60.60%	148	3.30%
21	78	61.90%	60	65.93%	138	3.07%
22	68	62.96%	60	55.04%	128	2.85%
23-24	146	73.74%	109	58.60%	255	5.68%
25-34	576	76.09%	363	53.86%	939	20.92%
35-44	595	79.33%	373	52.91%	968	21.56%
45-49	215	75.79%	129	48.13%	344	7.66%
50-54	225	80.36%	129	46.74%	354	7.89%
55-59	215	70.49%	138	38.76%	353	7.86%
60-64	166	51.88%	99	26.05%	265	5.91%
65+	127	14.98%	60	6.15%	187	4.17%
Total	2,723	N/A	1,766	N/A	4,489	100. %

EXHIBIT 2-C

WAGE AND SALARY EMPLOYMENT
MARIPOSA COUNTY
BY
PERCENT OF TOTAL EMPLOYMENT

1972 – 1980
ANNUAL AVERAGE

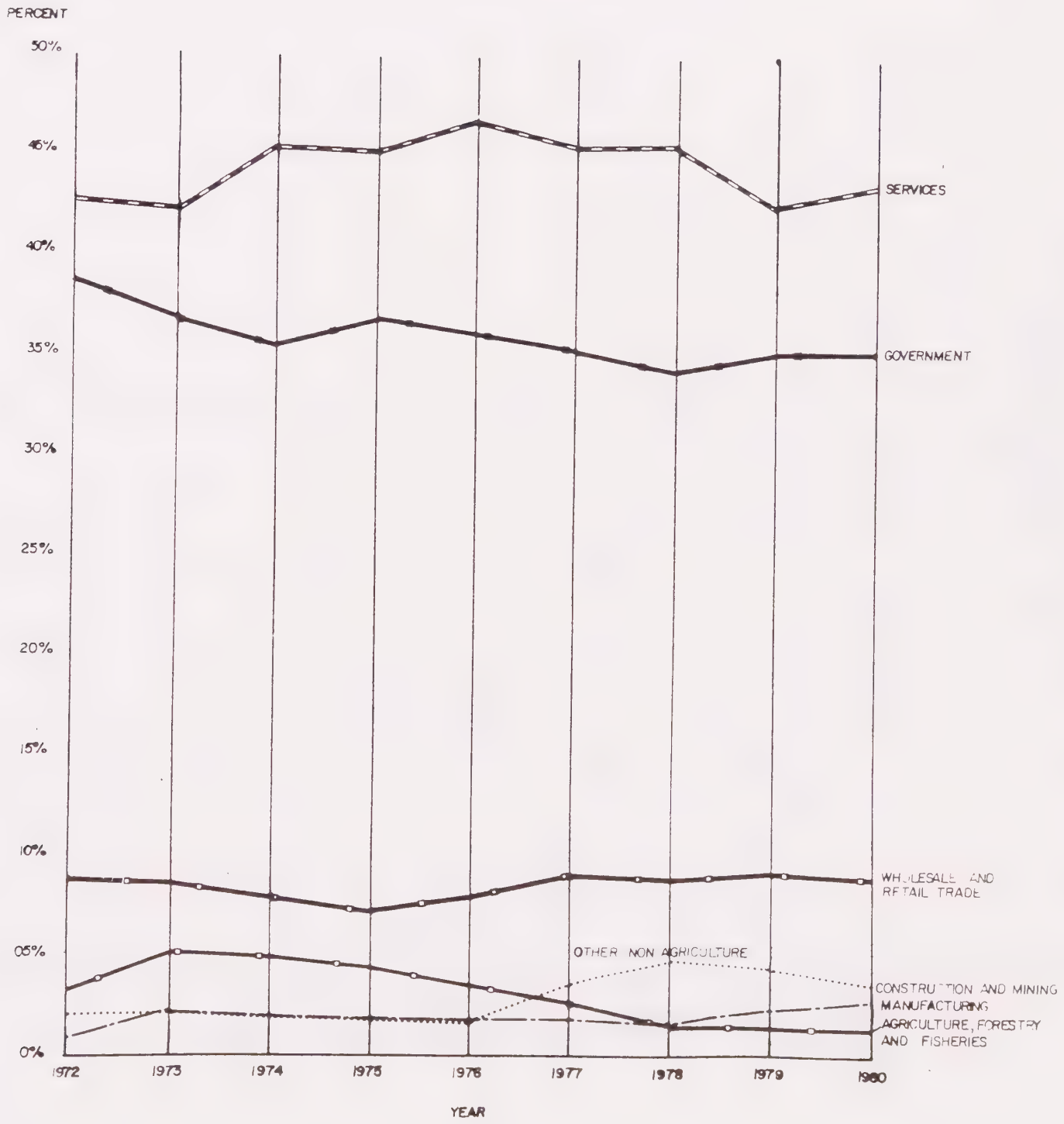


EXHIBIT 2-C

WAGE AND SALARY EMPLOYMENT
MARIPOSA COUNTY
BY
PERCENT OF TOTAL EMPLOYMENT
MONTHLY AVERAGES

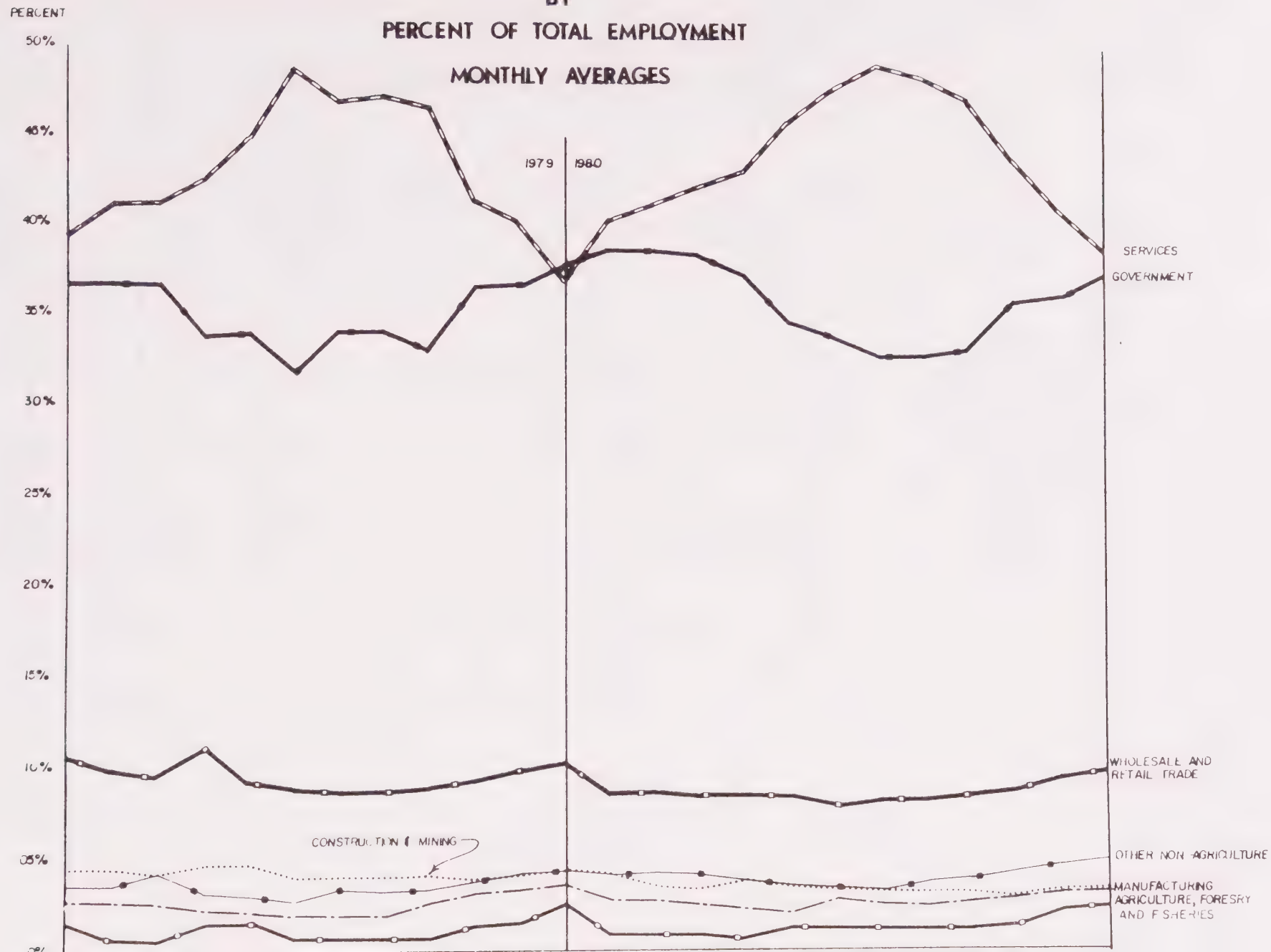


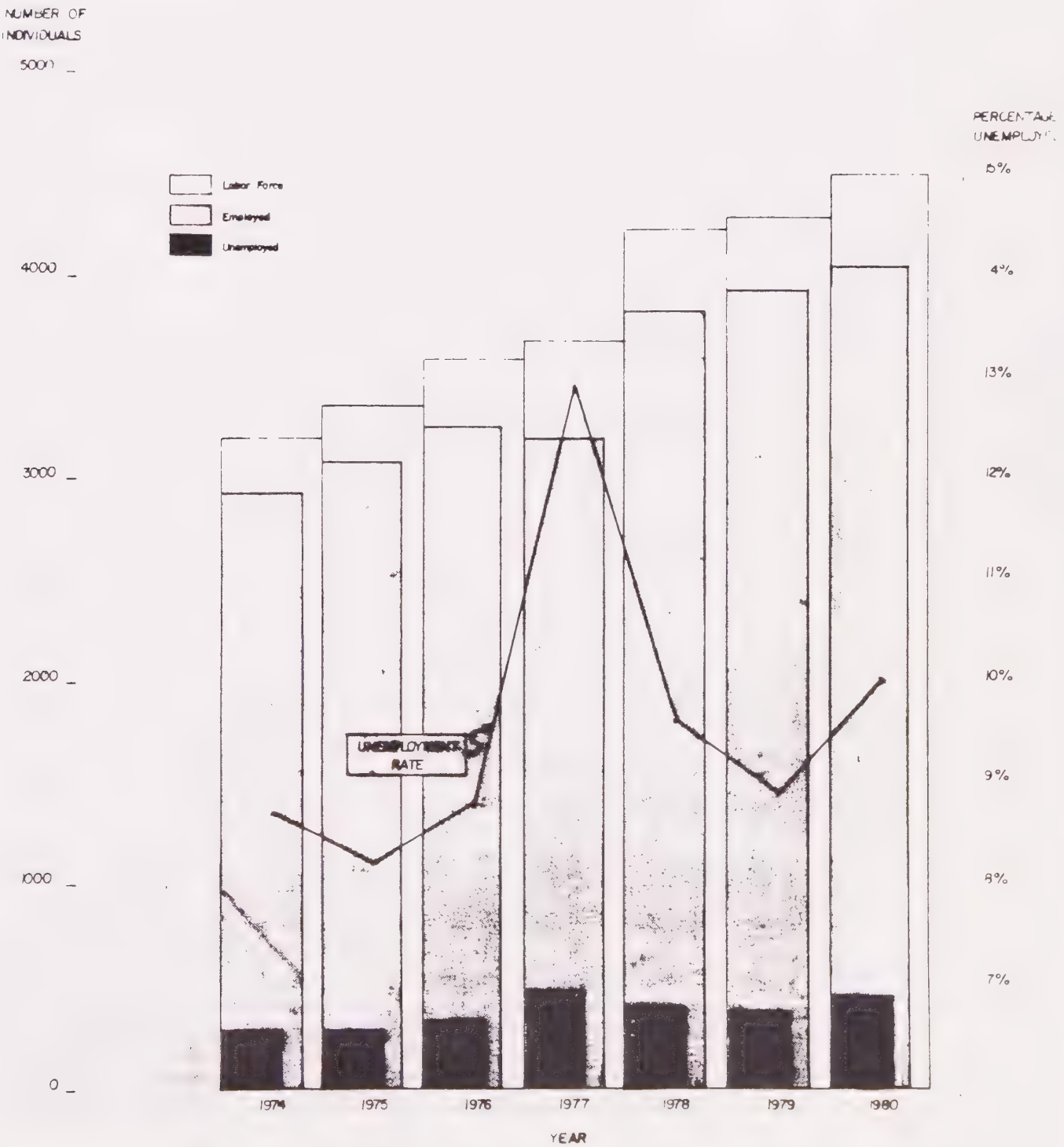
EXHIBIT 2-D

CIVILIAN LABOR FORCE EMPLOMENT AND UNEMPLOYMENT

MARIPOSA COUNTY

1974 to 1980

ANNUAL AVERGES



CIVILIAN LABOR FORCE EMPLOYMENT AND UNEMPLOYMENT
MARIPOSA COUNTY

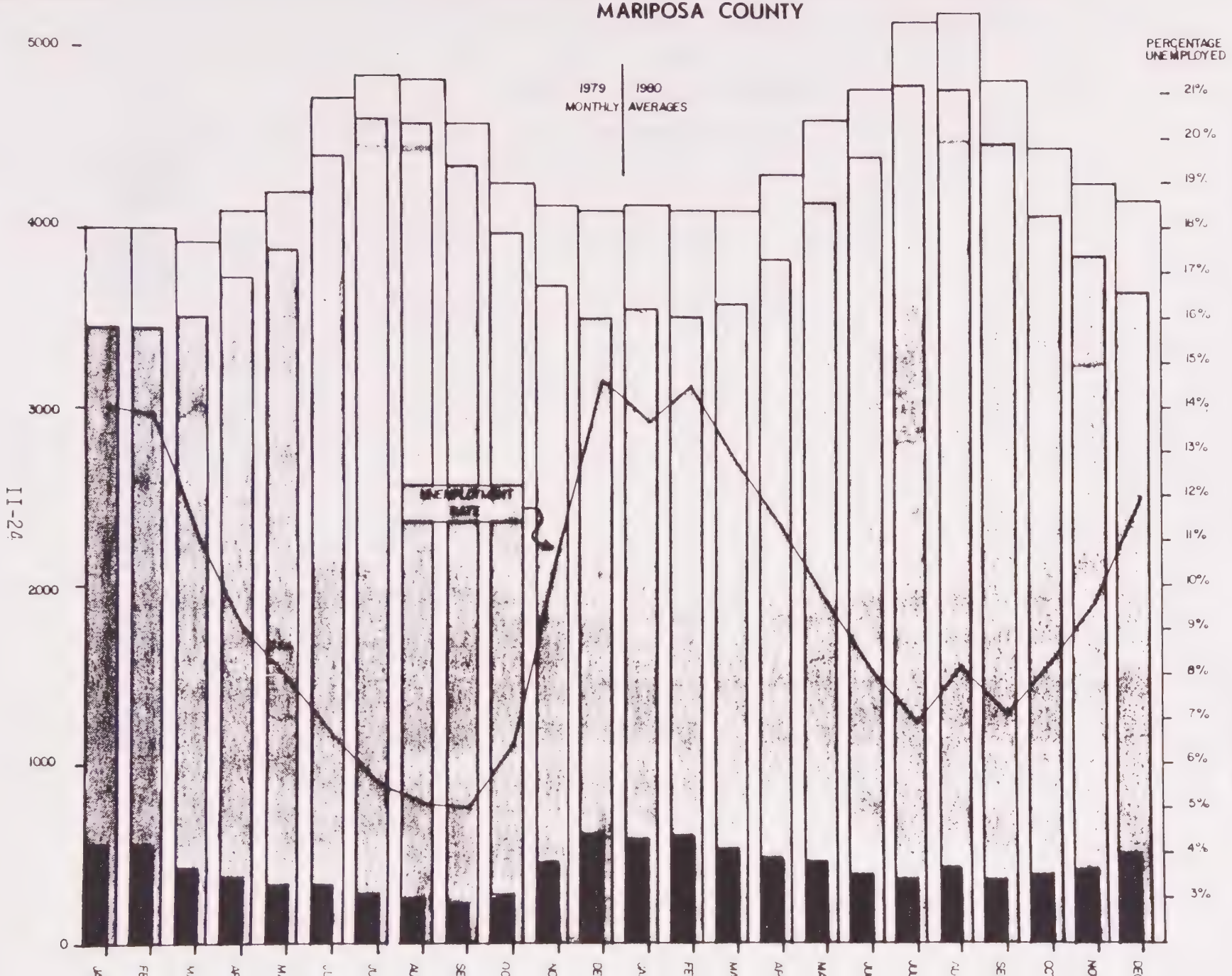


EXHIBIT 2-E

Government has represented between 35% to 38% of all employment. These two categories reflect the impact of tourism and government (Federal, State and local) on the local employment market. In general, there has not been any significant shifts in the county's employment sectors over the past nine years.

Exhibit 2-C shows the seasonal trends of employment between 1979 and 1980. The declines in service category employment during the winter months is due in large measure to the seasonality of the tourist season while the decline in government employment during the summer months tends to correspond with the school season. A large percentage of government employment opportunities are in our local school system. This government employment variation would be more pronounced if it were not for an increase in seasonal government job opportunities in the Federal land agencies such as the Park Service and Forest Service and State Fire Fighting crews.

2.303 Unemployment

Unemployment in Mariposa County is usually higher than state and national averages. Exhibit 2-D shows the range of employment/unemployment rates from 1974 to 1980. The 1977 average unemployment rate approached 13% but normally averages between 8% and 9% for the year. Annual employment averages do not adequately reflect the profound impact of the tourist industry on monthly employment averages. Exhibit 2-E shows the seasonal fluctuations both in labor force, employed and unemployed persons. The unemployment rate usually doubles during the months of January through February from the seasonal low unemployment months of July through September.

SECTION 3.000 GENERAL GOVERNMENT ORGANIZATIONS

RESERVED

To be Completed at a Later Date

SECTION 4.000 COUNTY ECONOMIC CHARACTERISTICS

RESERVED

To Be Completed at a Later Date

5.000 COUNTY ENVIRONMENTAL SETTING

INTRODUCTION

The following six data appendices are designed to be utilized as a support document for the Mariposa County General Plan and as a primary reference for site specific analysis. These appendices relate the past and present environmental trends and show the inter-relationship between elements of the natural and physical environment. References for each section provide a review of literature and serve as a secondary reference source for future studies. In this document cross sections or transects of Mariposa County are utilized to relate surface and subsurface features found on the western slope of the central Sierra Nevada. These vertical transects which show climatic trends, vegetation communities, soil associations and gross subsurface geology will help to illustrate these inter-relationships and thus relate the total dynamic environment of Mariposa County. These transects follow a line, identified on Exhibit 5-A, covering approximately 58 miles from the Great Valley on the western county line to the Sierran crest to the east. In addition numerous charts and graphs are included to help in visualization of specific conditions and trends.

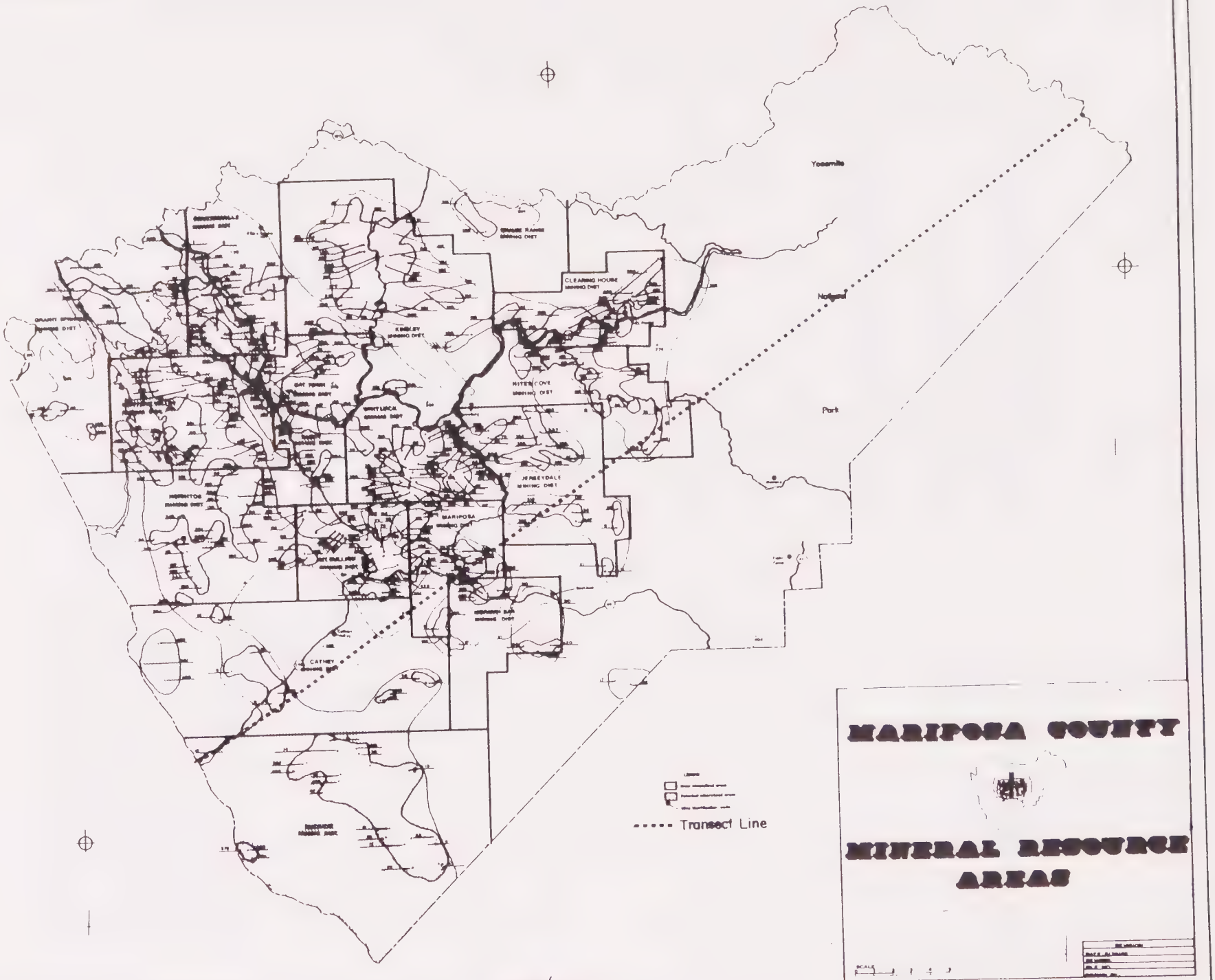

Yosemite
Park
Transect Line
MARIPOSA COUNTY
MINERAL RESOURCE AREAS

EXHIBIT 5-A

5.100 GEOLOGY

5.101 INTRODUCTION

The rock underlying Mariposa County has and will continue to create and support the physical and natural resources found here today. This dynamic system, through uplift, erosion, and deposition, is continually re-creating itself in differing patterns. The natural process affecting this change control man's utilization of the earth and thereby require him to become aware of the causes and effects of these events. Earthquakes, landslides and erosion are a few natural processes that create need for a better understanding of the land we inhabit. Mariposa County is by its regional mountain setting more process effected than areas of lesser relief and thereby demands additional acknowledgement of its constraints.

To gain perspective and knowledge regarding the Sierra Nevada and specifically Mariposa County an overview of depositional systems intrusion, deformation and uplift is offered in a geo-chronical format, see Time Scale Table I. This discussion briefly outlines the development of rock sequences, shows major times of intrusion, faulting and uplift, relates some effects of glaciation and identifies unique features. It must be noted that there exists numerous in depth articles and publications regarding the geology of this area and the Sierra Nevada in general. Interested readers are advised to consult the references for this section and Water Quality and Quantity Section for additional information.

A cross section of the County can be found on Exhibit 5-B and is included for insight on subsurface geology.

GEOLOGIC MAPS

Although Mariposa County is mapped on a 1:250,000 scale,[5 6] a far more detailed scale 1:24,000 exists. A geologic mapping on this scale is being developed for the county by the California Division of Mines and Geology and the United States Geological Survey. At present only select preliminary maps are available, on file at the Mariposa County Planning Office, which will be updated when new and additional maps are published.

5.102 GEOLOGIC HISTORY

A. The Paleozoic Era, 225 my - 570 my

The oldest rocks found in the Sierra are ordovician and reflect when this region lay hundreds of miles off shore on what is now recognized as a trailing continental edge or mio-geosynclinal environment, similar to what is now found along the Atlantic Seaboard. From an eastern source area silt and mud was shed onto this gradually sloping sea bed and on

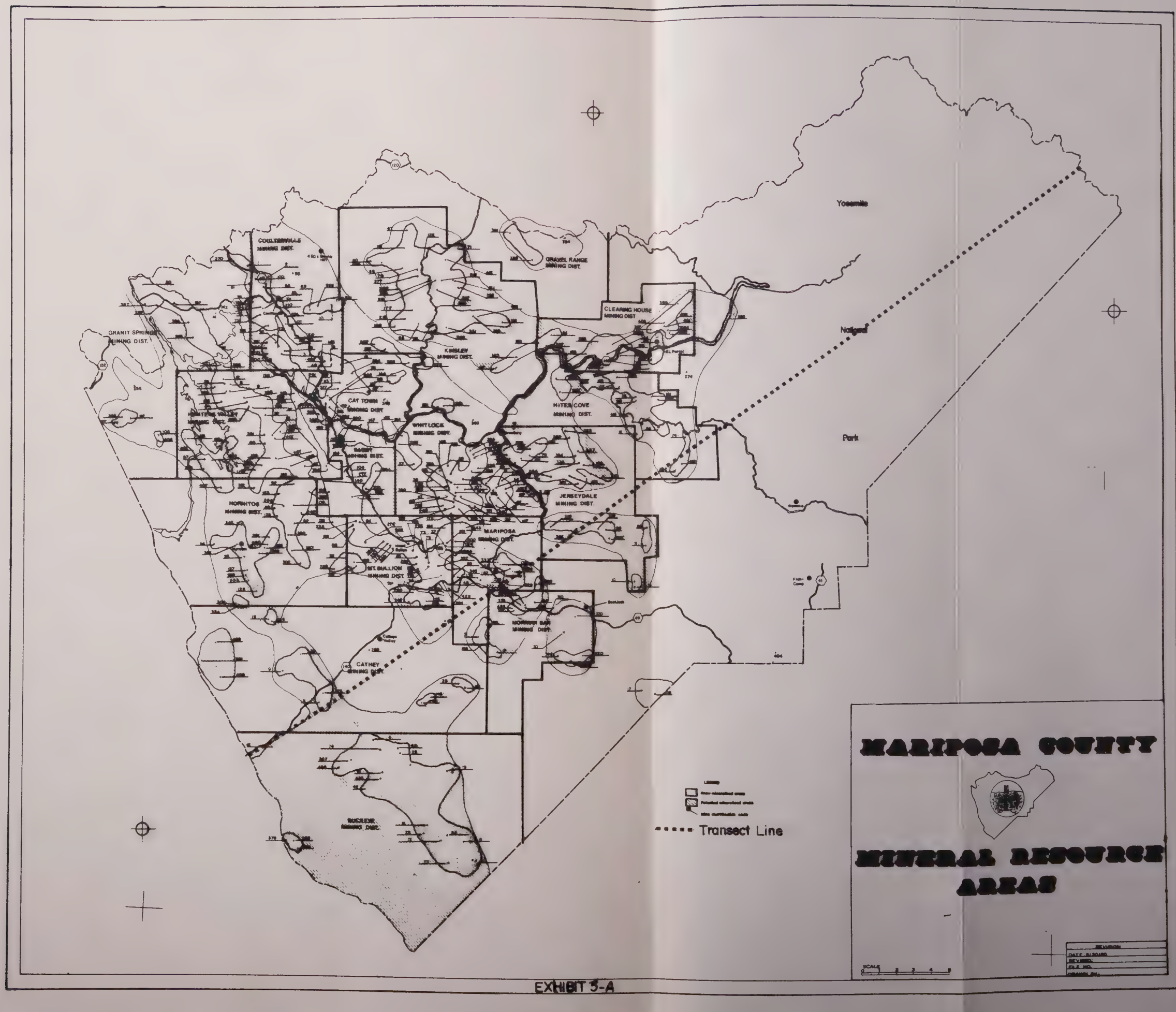

COULTERVILLE MINING DIST.
GRANIT SPRINGS MINING DIST.
GRAVEL RANGE MINING DIST.
CLEARING HOUSE MINING DIST
KINSLEY MINING DIST.
CAT TOWN MINING DIST.
HITES COVE MINING DIST.
WHITLOCK MINING DIST.
BAGBY MINING DIST.
JERSEYDALE MINING DIST.
HORNITOS MINING DIST.
MARIPOSA MINING DIST.
1ST. BULLION MINING DIST.
MORMON BAR MINING DIST.
CATHEY MINING DIST.
BUCKEYE MINING DIST.
Yosemite
National
Park
Transect Line
MARIPOSA COUNTY
MINERAL RESOURCE AREAS

EXHIBIT 3-A

TABLE I

RELATIVE GEOLOGIC TIME				ATOMIC TIME (in millions of years)
Era	Period		Epoch	
Cenozoic	Quaternary		Holocene	
			Pleistocene	— 2–3 —
	Tertiary		Pliocene	— 12 —
			Miocene	— 26 —
			Oligocene	— 37–38 —
			Eocene	— 53–54 —
			Paleocene	— 65 —
Mesozoic	Cretaceous		Late Early	— 136 —
	Jurassic		Late Middle Early	190–195
	Triassic		Late Middle Early	— 225 —
Paleozoic	Permian		Late Early	— 280 —
	Carboniferous Systems	Pennsylvanian	Late Middle Early	
		Mississippian	Late Early	— 345 —
	Devonian		Late Middle Early	— 395 —
	Silurian		Late Middle Early	430–440
	Ordovician		Late Middle Early	— 500 —
	Cambrian		Late Middle Early	— 570 —
Precambrian				– 3,600+ –

Fig. 1 The geologic time scale.

From Geology of the Sierra Nevada 16

the margins of the eastern shore line, reef complexes existed which added carbonates to the growing sediment accumulation. Lagoon environments formed on the lee side of reefs creating bays and estuaries. Intermittently underwater volcanic activity covered this sea bed with pillow and sheet flow basalts now recognized as the pyroclastic greenstone units found in this paleozoic rock record.

During the late Paleozoic the depositional environment changed due to plate movement resulting in deep ocean trenches, similar to what is presently found off the coast of Japan. This subduction zone or Eugeosynclinal environment appears to be the first major environmental modification of this region.

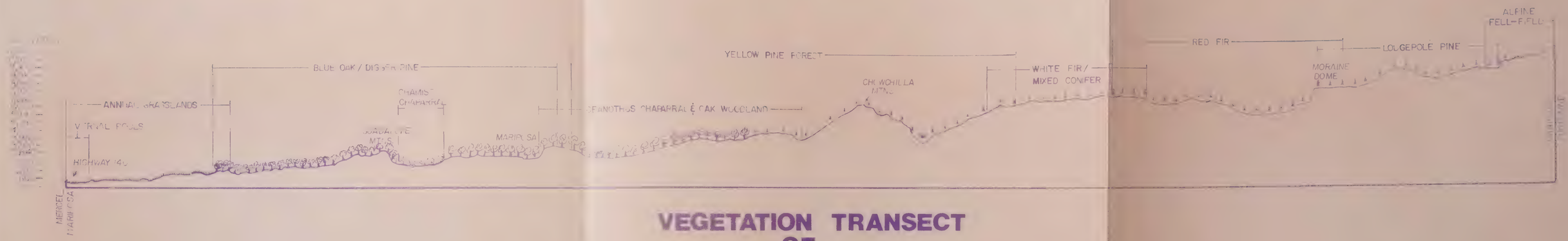
This Paleozoic rock recognized as the Calavaras Formation, described by Turner and Ransome,[2] occurs east of the Mother Lode thrust fault system. Isolated remnants known as roof pendants occur sporatically along the Sierran crest and are tentatively correlated to the Calavaras. Bower Cave is located in a limestone member of this formation which contains approximately 32,000 feet of slate, hornfels, phyllites, chert, marble and quartzite. This formation represents the rock of the ancestrial Sierra Nevada Mountains which arose in the Jurassic and reflects several stages of massive deformation. This uplift is discussed by Schweickert. 22

During the deposition of this sequence, localized uplifts produced erosion, creating "gaps" or unconformities in this rock record which make difficult the deciphering this stage of Sierran history.

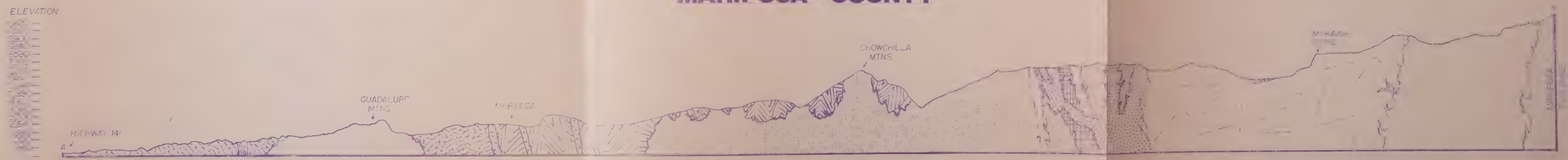
B. The Mesozoic, 65 my to 225 my.

The Triassic, unknown in Mariposa County, constitutes a major unconformity between the older Calaveras Formation and the Amador Group of Jurassic Age. The Mesozoic Era began with subsidence and resulting deposition created thick sequences of pillow basalts, chert and slate. This development is amplified by Bateman and Wahrhaftig in Bulletin 190 [3] California Division of Mines and Geology.

The Nevadan Orogeny, which produced the first series of two Sierra Nevada Mountain systems, created by the inplacement of the first granitic plutons, occured during the Jurassic and subjected the Calavaras and Amador formations to a series of folding and deformation according to Calkins, 1930.[15] It was at this time that the inplacement of minerals in the region of the Mother Lode system took place, this is elaborated on by Smith [19] 1981. At this time the mafic serpentine intrusions near Bagby were injected along high angle thrust faults which form the Soapstone and Jade deposits identified by Evans, 1966.[9] According to Hill, 1975.[10] This mountain system formed a series of North-West-South-East series of ridges that formed west of the present Sierran axis and extended into what is now the great valley. This mountain chain would resemble

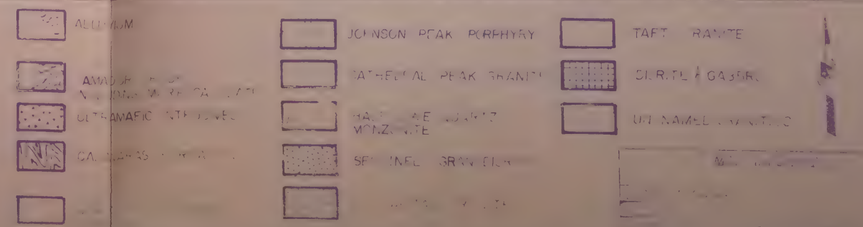


VEGETATION TRANSECT OF MARIPOSA COUNTY



GEOLOGICAL TRANSECT OF MARIPOSA COUNTY

EXHIBIT C-6



the present day Appalachian Mountains. This mountain system developed a structurally controlled drainage system which flowed primarily to the Southeast and shed sediment into a lagoon margined sea which is now the Great Valley.

As the Granitic pulses continued through the Creaceous more than nine vertical[3] miles of rock was shed into the present valley basin. The end of the Mesozoic Era was also the end of the major granitic pluton intrusions and what remained of the ancestral Sierra Nevada constituted a small series of ridges approximately 3000 feet in elevation at their highest point.

C. The Cenozoic Era, 65 my to the Present.

With the beginning of the Paleocene a warming trend produced tropical conditions that created a deep red lateritic soil mantle that was periodically covered by Andesitic volcanic flows that occured south to what today is the Madera-Mariposa County line. This early landscape is now exumed and presently yields most of the gently rolling foothills and pastures of today.[2]

The Eocene saw the decline of the tropical climate[8] and a decrease of erosion. Remnants of Eocene gold bearing channels can be found on the northern county boundary above Coulterville, and the Ione formation, a fossiliferous river channel system containing alluvial and pyrociastic material,(Palmer, 1978) was subsequently created. The outwash from these stream systems produced the coal and lignite beds recognizable in the valley today.

In the Oligocene the beginning of the first pulse of Sierran uplift occured in addition to major rhyolitic lava flows as described by Selmmons. This period of major vulcanism gradually inundated all of the valley remnants or the ancesteral Sierras leaving exposed only the higher ridges or more resistant greenstone. The subduction of the Farallon plate and the spreading ridge system formerly off the California coast occured late in the Oligocene and this boundary between the Pacific and North American plates became a transform fault, the present day San Andreas.

The Miocene saw the beginning of a climatic cooling trend and the continued occurance of Rhyolitic flows. It should be noted that a reconstruction of the Sierran block uplift is possible through slope angle analysis of stream beds of this time.

The Pliocene saw continuation of the cooling trend and a change in the consistency of the continuing volcanic flows from Rhyolitic through andicitic to basaltic. Audicite presently preserves the Ione formation near Buck Meadows Lodge. A notable event occured during mid or late

Pliocene, the major period of uplift of the present day Sierra Nevada. The tilting of this block along an En-Echelon Zone of movement to the east resulted in 10,000 feet of vertical movement that tilted the valleys and affected the westward flowing rivers resulting in 2,000 to 4,000 feet of downcutting A study of slopes and stream channel nick points developing evidence for time and rate of uplift is discussed by Mattheus.[14]

Four Ice Ages occuring in the Pleistocene, of which the advances and retreats of the glaciers carved the Sierran crest and upper valleys into the recognizable landscape of today. Moraine sequences can be seen in El Portal and are but another reminder of this era of ice. Mima mounds, thought to be an ice age or Pleistocene occurance were developed at this time, are mounds found near the western county line.

Recent occurances include continued uplift of the Sierras, 15 feet in 1872 Owens Valley Earthquake, and a pronounced warming trend.

5.103 MINERALS

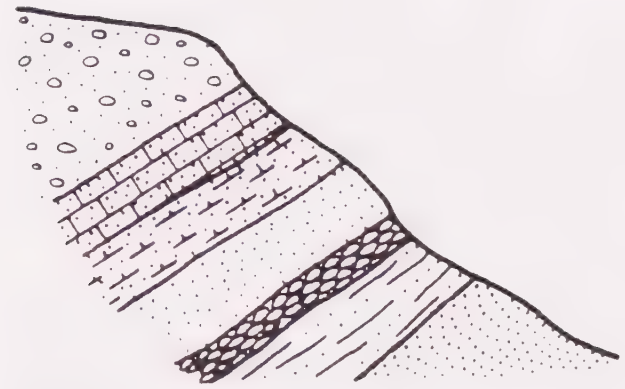
Mining has and will continue to play a very important part in the development of Mariposa County. The unique types of metamorphism found in the Mother Lode and the surrounding country rock developed a diverse array of rocks and minerals. These metallic and non-metallic minerals are listed below.

Metallic	Non-Metallic
Chromium	Andalusite
Copper	Asbestos
Lode and Placer Gold	Barite
Lead	Clay
Manganese	Limestone and Dolomite
Nickel	Magnesite
Platinum	Mica
Mercury "Quicksilver"	Rock, Sand and Gravel
Silver	Roofing Granules and
Tungsten	Terrazzo Chips
Zinc	Silica
	Slate
	Talc, Pyrophillite and
	Soapstone

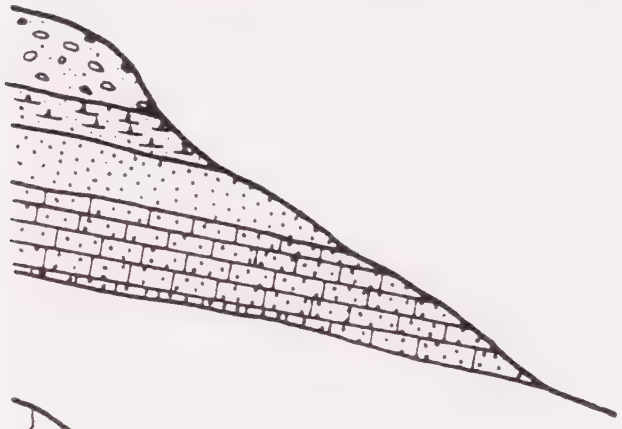
The location, mode of occurance and development of these resources is discussed in the California Division of Mines and Geology's Vol. 53[2] which in addition includes production rates, assays and the histories of individual mines located in Mariposa Co. Exhibit 5-A contains a map of Mariposa County showing known areas of mineralization. Two systems or belts of mineralization have been identified in the County, the eastern gold belt and the western copper, these are described by Smith, 1981.[18]

TABLE 2

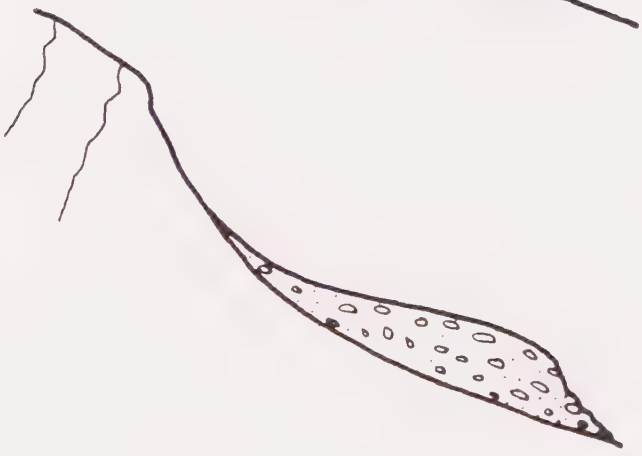
STRUCTURE AND SLOPE STABILITY



Beds dipping into slope or vertical are more stable but here soil creep, notices by leaning trees, fence posts or beds that turn down hill, can occur.



This dip structure is unstable and due to water percolation and varying bed resistance is prone to slippage along bedding planes.



A slide of unconsolidated material, similar to this representation, produces a cuspate scar at the head, is subject to further movement and must be considered unstable.

All of the above are susceptible to slumping if the slope is severely undercut.

The following table is a general guide for assessing slope stability. Cohesive soils may be stable at steeper slopes.

Material	Angle of Repose Degrees	Slope, percent
Rock, hard and blocky	45	100
Sand and gravel (rounded grains)	22	40
Clay and silt (massive or deep)	17	30

5.104 STRUCTURE AND FAULTS

The several periods of mountain building, erosion and deposition acted on the Paleozoic Calavaras Formation, and to a lesser extent the Mesozoic Amador Group, by folding, thrust faulting as well as localized intrusions of quartz, hot springs and ultramafics, all of which produced a melange of contorted beds. These features can be interpreted either on a regional basis reflecting the axes of major deformations or quite specifically, utilized to reflect superposition and depositional environment.

These formations are complexed by a north-west/south-east series of high angle thrust faults, the Melones and Bear Mountains systems which appeared during the mid Jurassic [3] and reflect deep penetration into mantle material indicated by the presence of intruded ultramafic material within the boundaries of this system. Localized faulting is recognized [2,3,7,14] as existing in the county and has been locally active, offsetting beds of recent alluvium. Activity of these systems is a possibility due to the continued uplift of the Sierran block. For additional information readers are directed to the references.

5.105 LANDSLIDES

The natural process can be induced in areas that exhibit structural and or slope angles that exhibit specific characteristics, see Table 2 .

5.106 REFERENCES

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5.200 Soils

5.201 Introduction

The soil on private lands in Mariposa County was mapped by the Soil Conservation Service and is presented in The Mariposa County Soil Survey, 1974, which is hereby incorporated by reference. This document reflects a broad classification based on rock origins and physical characteristics and identifies and delineates seven series or associations. These associations are further subdivided on the basis of soil profile variations and slope.

Soil is a natural resource which supports vegetation, wildlife and human occupation, the latter being of basic concern. Accelerated erosion and percolation limitations are primary concerns. The first creates siltation in ponds, streams and lakes, highly modifies existing topography and destroys potential groundwater recharge areas. The second effects to set limits on areas of development either as a function of slope or specific physical characteristics that require specific, precise engineering design. Mariposa County soils include recently deposited alluvium, exumed lateritic paleo soils or soil ,that developed in situ and through down slope movement intermingled. Granite and metamorphic rocks are the origins of soils in the County and each soil derived from these sources exhibits unique characteristics that either effect erosion or percolation.A transect showing general soil associations,Exhibit 5-C can be correlated to the Geology Transect Exhibit 5-B.

Granite weathers through expansion of a mineral named biotite which causes a physical breakdown in the rock mantle. Included with biotite are feldspars and quartz particles. When this granitic mantle or grus is exposed to moving water quartz particles, which are easiest moved, they begin a downward migration usually bringing with them the decomposed remnants of biotite and feldspar. Thus due the average size of a resistant particle these slopes are prone to accelerated erosion.

Metamorphic rocks,which originate from the deposition of clay and silt,yield these particles when decomposed thus producing areas of high clay content which inhibit percolation and create septic problems. Other metamorphic rock units produce other particles and combinations, all of which can effect development.

Accelerated erosion is of prime concern to Mariposa County residents and our down slope neighbors. Through erosion control practices of slope control, mulching and reseeding, much can be done to limit the effects of development created erosion and subsequent destruction of riparian habitat, surface and subsurface water supplies. These control measures can be used in conjuction with wildlife habitat reconstruction and will result in retaining the natural aesthetic landscape of Mariposa County

5.202 Soil Survey Classifications

The Soil Conservation Service is presently compiling additional data on specific soil series found in Mariposa County. This information is presented in Soil Survey Interpretations utilizing soil properties and slope to grade suitability of specific series and is presented in the following outline form:

Type

Description

Elevation

Vegetation
Climate
Origin
Slopes

Estimates Soil Properties

Depth
Texture
Particle Size
Liquid Limit and Plasticity Index
Permeability
Water Holding Capacity
Ph, Salinity, Shrink-Swell Potential, Corrosivity
Erosion Factors

Flooding

High Water Table, Depth, Kind, Months

Cemented Pan, Depth, Hardness

Subsidence, Initial-Total

Hydrologic Grouping

Frost Action

Sanitary Facilities

Septic Tank Absorbtion Fields
Sewage Lagoon Areas
Sanitary Landfill, Trench, Area and Cover

Source Material

Road Fill
Sand, Gravel
Topsoil

Community Development

Shallow Excavations
Dwellings with/without Basements
Small Commercial Buildings
Local Roads and Streets

Water Management

Pond Reservoir Area
Dikes and Levees
Aquifer Fed Ponds
Drainage, Irrigation
Terraces, Diversions and Grassed Waterways

Recreation

- Camp and Picnic Areas
- Playgrounds
- Paths and Trails

Capability and Predicted Yields

- Crop and Pasture

Woodland Suitability

- Management Problems
- Potential Productivity

Wind Breaks

Wildlife Habitat Suitability

- Plant and Animal

Potential Native Plant Community

- Species List
- Percentage Composition
- Potential Production in Lbs/Ac Dry Weight

This information is a synthesis of data found in the Mariposa County Soil Survey, Soil and Capability Map Summary, and additional field testing and research. Using the information on these sheets it is possible to determine land use possibilities, rates of erosion and other basic soil characteristics. It must be observed that there is no substitute for actual site specific studies developing qualitative data for a clearer understanding of particular constraints and options. For additional information please consult the following references.

5.203 REFERENCES

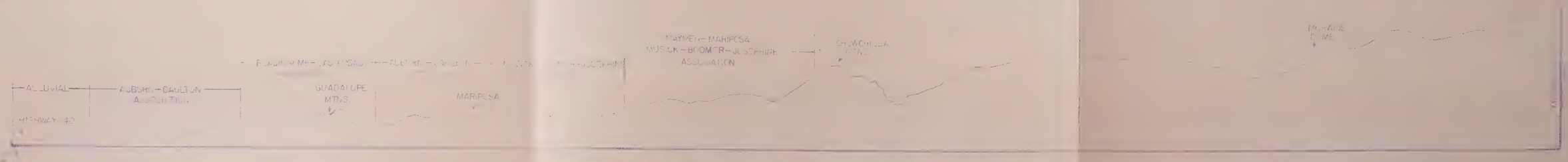
1 P. Birkeland, Pedrology, Weathering and Geomorphological Research (Oxford University Press N.Y., 1974).

2 N. Bradly, The Nature and Properties of Soils (Macmillian Publishing Co., N.Y., 1974).

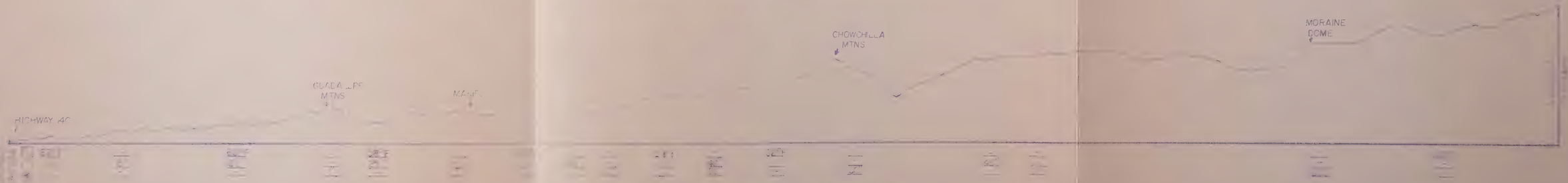
3 Buol, Hole and McCrachken, Soil Genesis and Classification (Iowa State University Press, 1973).

4 C. Hunt, Geology of Soils, Their Evolution, Classification and Uses (W. H. Freeman & Co., 1972).

5 U. S. Department of Agriculture, Soil Survey of Mariposa County Area, California (University of Ca. Press, 1974).



APPROXIMATE SOIL SERIES TRANSECT OF MARIPOSA COUNTY



CLIMATIC PROFILE OF MARIPOSA COUNTY

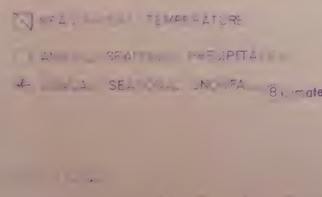


EXHIBIT 1-C

5.300 CLIMATE

5.301 INTRODUCTION

The following section is presented in three sections. The first will be an overview of general climatic trends, wind conditions and growing seasons. The second section will outline current air basin conditions relating to air quality and pollution potential. The third will list what data collection and analysis is needed for further in depth analysis of present and future conditions. Readers are directed to the references for further specific data and information. A transect showing precipitation, temperature and snowfall can be found on Exhibit 5-C and Exhibit 5-D shows precipitation trends from 1888 to 1980.

5.302 CLIMATIC OVERVIEW

"The climate of Mariposa County Area is varied. Summers are hot and winters are mild at low elevations, and summers are mild and winters are cold at high elevations. This results in a long growing season near the San Joaquin Valley and a rather short season at high elevations. Precipitation in the western part of the Area is light, but it increases with elevation to fairly heavy amounts in the mountains. There is heavy snowfall in the higher mountains, but little or none falls near the San Joaquin Valley. Winds generally are light, although exposed locations occasionally experience strong or damaging wind. There is abundant sunshine during summer but a considerable amount of cloudiness during winter.

Elevation influences temperature to such an extent that isotherms generally parallel the contours of elevation and do not run from west to east, as would be the case if solar insolation and latitude were the controlling factors. The terrain is sufficiently irregular, however, that local influences are often dominant. Drainage or blocking of cold air often results in local areas being considerably warmer or colder than surrounding areas.

Elevation also influences the amount of precipitation received. From a very light annual total in the San Joaquin Valley, rainfall increases with elevation to a maximum between 6,000 and 7,000 feet. Rainfall tends to diminish above that level.

Summers are warm to hot, and winters are moderate to cold. The maximum temperature in July averages about 95° F. at lower elevations in the county, but it drops to about 90° near 5,000 feet. Temperatures in summer commonly cool off at night. The average minimum for July ranges from 60° at the lower elevations to less than 40° at the higher ones.

In January the average minimum temperature is about 35° at 500 feet elevation, but it diminishes to about 28° at 5,000 feet level and to less than 20° at the higher elevations. Average maximum readings

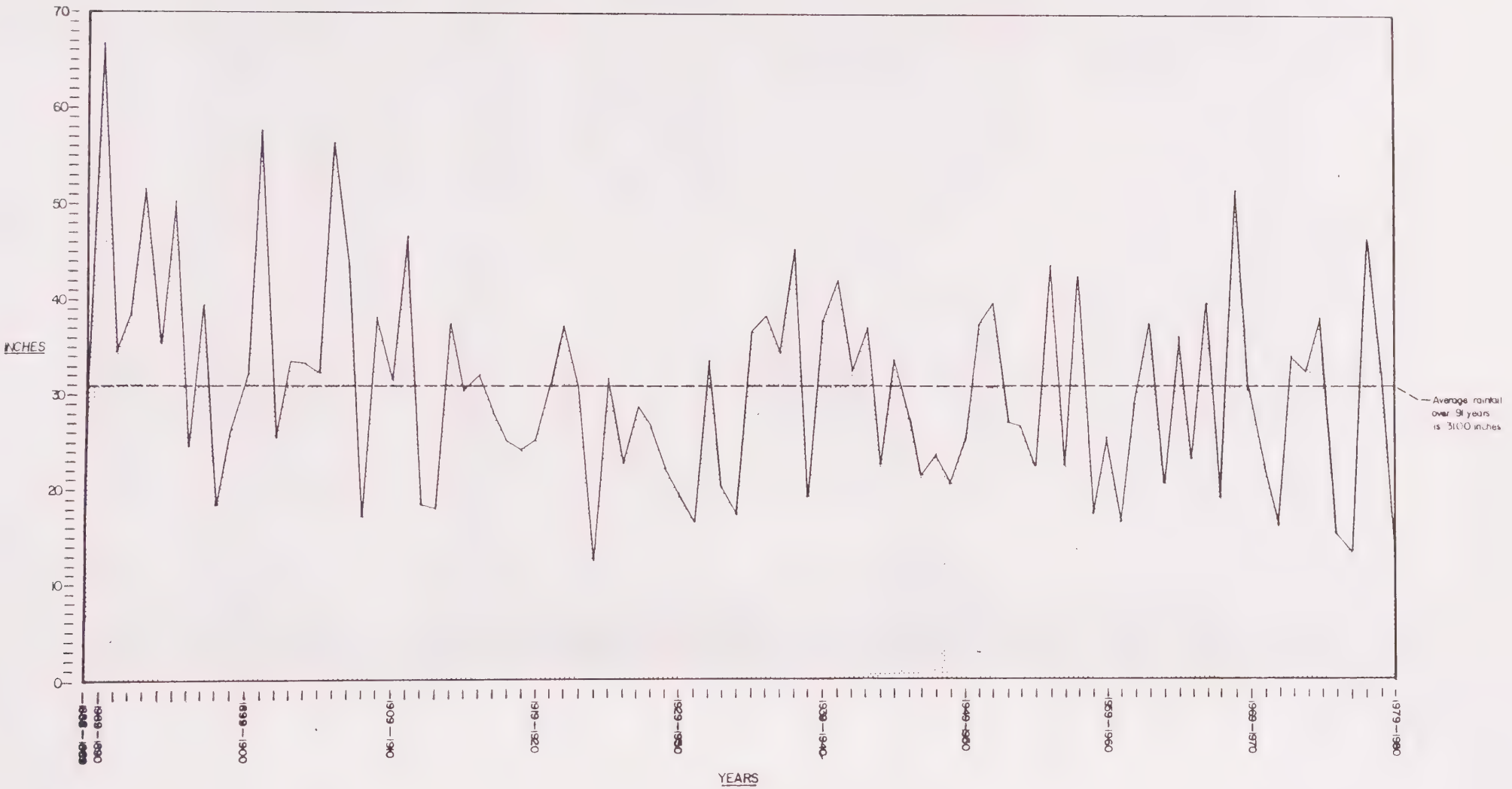
MARIPOSA YEARLY RAINFALL

1888 TO 1980

AS GAUGED AT THE MARIPOSA

COURTHOUSE SITE

EXHIBIT 5-D



range from 55° in the Valley to below 45° in the mountains. At the lower elevations only 30 to 40 days per year have a minimum temperature of 32° or less, but at the higher elevations, the figure reaches 150 days or more. Temperature data for two stations in the Mariposa County Area are given in table 1.

It is likely that some of the higher points in the survey area are subject to freezes almost every month of the year. The average date of the first 32° temperature in fall ranges from early in September in the mountains to as late as the end of November at low elevations. Based on the average dates for 32° readings, the growing season is more than 250 days in the Valley and more than 100 days in the mountains.

The average seasonal precipitation is less than 15 inches in the southern corner of the Area. As moist air is lifted over the Sierras, precipitation increases with elevation to about 50 inches.

Most of the precipitation falls in winter, 85 percent to 90 percent of the annual total falling from November through April. Normally, 60 to 90 days per year have a precipitation of 0.01 inch or more, 30 to 50 days have 0.10 inch or more, and 10 to 25 days per year have 0.50 inch. Rain occurs on the greater number of days at higher elevations. Thunderstorms occur less than 3 days per year in the valley and more than 20 days per year at high elevations.

Snow falling at high elevations and melting in spring and early in summer provides irrigation water for the San Joaquin Valley. The Merced River normally provides more than 830,000 acre-feet of water per year, much of it from melting snow.

On the valley floor snowfall is infrequent, and when it does fall, it melts almost immediately. Precipitation and snowfall data for three stations in the Mariposa County Area are given in table 2.

At low elevations in the vicinity of the San Joaquin Valley, winds tend to orient themselves northwesterly or southeasterly along the major axis of the valley. The predominant wind direction by a substantial margin is from the northwest. In the mountains wind directions are dominated by the local topography, the winds usually blowing up and down major valleys and canyons.

Winds are usually light to moderate, except for infrequent strong winds associated with one of three situations. In summer, thunderstorms can cause strong winds within local areas, particularly at higher elevations. In winter, migrant low-pressure areas occasionally result in strong winds over the entire county, except for local sheltered areas. Occasionally, at various times of the year, high-pressure areas over Nevada and Utah and low-pressure areas to the west result in strong, warm, dry winds down the slope of the Sierras. These winds are drying to crops

timber, and grasslands, and this often produces a serious fire hazard.

In moderately exposed areas, winds reach 45 to 50 miles per hour on an average of once in 2 years and 80 miles per hour on an average of once in 50 years. In sheltered areas speeds are less, and in exposed areas speeds are greater."[6]

TABLE 1—*Temperature data*

Month	Wawona ranger station					Exchequer reservoir				
	Highest	Average maximum	Average	Average minimum	Lowest	Highest	Average maximum	Average	Average minimum	Lowest
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
January	67	50. 5	35. 0	19. 9	−21	73	56. 3	46. 8	37. 3	23
February	70	51. 1	37. 3	23. 8	−10	80	63. 0	52. 3	41. 5	24
March	77	59. 5	42. 9	26. 5	−3	84	68. 2	55. 9	43. 5	30
April	84	64. 8	47. 4	30. 7	13	93	73. 9	60. 8	47. 6	36
May	92	73. 0	54. 0	35. 0	21	99	80. 1	66. 2	52. 2	38
June	97	78. 6	58. 7	38. 7	24	112	90. 1	75. 1	60. 1	43
July	102	89. 4	65. 9	42. 4	31	114	96. 2	80. 3	64. 4	52
August	101	90. 7	65. 8	40. 9	28	106	95. 9	79. 9	63. 9	51
September	99	82. 7	59. 4	36. 0	24	110	91. 6	75. 7	59. 8	48
October	90	70. 3	50. 1	29. 9	14	101	85. 4	70. 4	55. 4	36
November	79	59. 7	40. 9	22. 1	4	89	74. 3	59. 5	42. 7	28
December	76	54. 1	37. 9	21. 6	2	80	58. 3	48. 4	38. 5	28
Year	102	68. 7	49. 6	30. 6	−21	114	77. 8	64. 3	50. 6	23

TABLE 2.—*Precipitation data*

Month	Average precipitation at—			Average snowfall at—		
	Exchequer reservoir	Mariposa	Wawona ranger station	Exchequer reservoir	Mariposa	Wawona ranger station
	Inches	Inches	Inches	Inches	Inches	Inches
January	3. 48	5. 68	8. 13		3. 9	24. 8
February	3. 50	5. 83	6. 75	0	1. 2	17. 4
March	3. 21	4. 58	5. 47		. 1	16. 3
April	1. 80	2. 49	3. 75	0		3. 8
May	. 65	1. 01	1. 67	0	0	. 1
June	. 15	. 16	. 35	0	0	0
July	0	. 01	. 09	0	0	0
August		. 01	. 04	0	0	0
September	. 26	. 39	. 47	0	0	0
October	. 79	1. 35	1. 78	0	0	. 1
November	1. 79	2. 80	4. 25	0	0	. 6
December	3. 52	5. 64	7. 49	0	. 5	11. 0
Year	19. 16	29. 95	40. 24		5. 7	74. 1

5.303 AIR BASIN CONDITIONS AND TRENDS

The following excerpt from The Implementation Plan of the Mountain Counties Air Basin,[4] basically outlines what information is presently circulated among Central Sierran counties.

"Air flow in the Mountain Counties tends to be dependent upon altitude and season. In the western foothills, wind directions are generally very similar to those of the valley floor adjacent to them. A characteristic summer daytime flow is from the south, as the cool maritime air of the Pacific Ocean enters the Central Valley through the Carquinez Straits and through lesser gaps in the coastal mountain range and flows northward to replace rising air in the valley. This flow is experienced in the foothills to an elevation of about 1200 feet.

In the higher elevations this northward foothill sweep is deflected by numerous ridges and ranges to create a wide diversity of air flow patterns. All of these are governed by the local terrain, especially the surface level effects.

In the absence of strong barometric pressure gradients occurring during the fall and late summer, nighttime cold density flows are especially pronounced. These density flows lead to a pooling of cold air with a temperature inversion at the top of the pool. This subsidence inversion is usually stabilized at a time in the morning partially dependent upon the canyon's orientation. A canyon sloping toward the morning sun will experience an earlier cessation of the flow than will a canyon oriented perpendicularly to the sun's rays since, in the latter case, the ground surfaces will not be heated by the sun as early in the day.

After a period of confused flow during the transition from nighttime to daytime flow, the air will tend to flow up the canyon. The degree to which this up-canyon flow becomes established is dependent on both the geometry of the canyon and the strength of flow induced by large-scale weather features. The canyon flows do not follow the idealized patterns under high pressure gradients found during the cold season.

In winter, the wind directions are generally dependent upon the passage of frontal systems through the area. Southerly winds generally occur as a front approaches with a marked shift to the northwest or north after the front has passed. The strongest northerly winds occur after the front has passed, decreasing in speed over a period of a few days. After some winter frontal passages, an intense high pressure anti-cylonic circulation may develop over Oregon causing a large supply of cold continental air from the Great Basin to be forced into the Sierras.

Each of these flows is felt most strongly along the tops of ridges and peaks in the region, developing winds up to gale force. The flow velocity near the surface level of the canyons is a function of the

orientation of the canyon with respect to the wind. In canyons that are parallel to the flow, the velocity can be almost as strong as the condtions that exist near the ridgelines, whereas in canyons normal to the flow, conditions are much less severe.

As a general rule, air flow on a hillside is downslope at night and upslope in the daytime. Again, the onset of upslope flow and its intensity depend on the timing and intensity of the heating of the surface by the sun. Smoke from fires on east-facing slopes will dissipate better than that from fires on west-facing slopes during the morning hours while the reverse will be true in the afternoon.

Good dilution of smoke will be obtained under meteorological conditions favorable to vigorous vertical air motions. The two principal meteorological conditions most favorable to such vertical motions are strong surface winds and intense surface heating. In the case of strong winds, orographic effects will induce mechanical turbulence and vertical mixing. In the case of solar heating, the vertical currents are induced thermally. Thus good dilution may be expected when strong winds are forecast or when strong thermal updrafts are expected. Forecasts of these updrafts are not issued as such directly but instead are indicated indirectly by forecasts of thundershowers - a good indication, or of afternoon cloudiness in summer - a good but less strong indication of thermal updrafts.

With these few facts defining the region, a few statements can be made concerning the future growth of the Mountain Counties. The expansion of recreational development will slowly engulf certain regions with a maze of housing and commercial enterprises, creating motor vehicle congestion now beginning to be felt. These complex sources are especially prone to develop in the recreational basin centers of the Sierras. Attention will have to be given to the planning of these sources so as not to disturb one of the resources visitors come to enjoy; the quality of the air.

With some exceptions, industry is not expected to construct large facilities in the Air Basin because of the transportational and meteorological difficulties inherent to the region. The foothill section of the Mountain Counties is expected to be a target for expansion of the mineral and forest products industries due to the large concentration of related resources. With future constraints on industrial density in other parts of the state, the foothill area may also attract other industries.

The increase in the number of recreational participants will lead to greater utilization of the Basin's natural resources, adding to the work load of the public recreation and fire protection agencies. With the increase in forest management and hazard reduction burning, an

emission problem all of the Mountain Counties face, greater coordination will have to be guaranteed between air pollution control and resource development. Although the basis for cooperation has been established, more work will be needed to mesh the efforts of these two public entities.

Control Strategy

As the initial Basin goals of compiling and assessing the stationary source inventory and enforcing compliance of the existing sources are nearing achievement, the Mountain Counties will concentrate on compliance maintenance and improvement of programs to study, evaluate and upgrade ambient air quality.

Compliance maintenance of stationary sources will be implemented through a number of existing and proposed programs. The source testing and engineering evaluation programs will be continued to complete emission documentation for regulatory enforcement. The establishment of standardized inspection procedures and schedules will be achieved through the cooperation of the Mountain Counties and their staffs. Coordination of the sharing of expertise relating to stationary source operation and control will be developed to improve the control efforts of the private sector, generate an improved balance between economic impact and compliance and facilitate enforcement.

Ambient air quality programs will seek to develop a better understanding of regional problems, improve the identification of significant emission sources and increase the effectiveness of control regulations. The Basin will continue to pursue the establishment of an adequate monitoring network programmed to measure the spectrum of air contaminants. Modeling techniques estimating ambient air quality impact of source emissions on local and regional levels will be improved through coordination with the Air Resources Board. Closer liaison with local land use planning agencies will be developed to improve the area source data base and provide air quality data input and recommendations to land use decisions. Area source regulations, especially those relating to agricultural burning, will be reevaluated to determine efficiency and effectiveness. An improved public information program will be implemented to better acquaint regulatory agencies and the general public of local and regional air pollution control programs.

This "state of the art" information is being circulated throughout the mountain communities and is the basis for a series of rules and regulations that are hereby incorporated by reference of the above text.

Additional studies by the Air Resources Board give computer generated data on an impressive list of potential pollutants using 1972 OBERS]

population projections which offer projections on 1987 forcasted emissions potential. The Mariposa County Air Pollution Control District's nonattainment plan for photochemical oxidants is hereby incorporated by reference.

5.304 NEEDS FOR FURTHER INFORMATION

The following data and studies are required to gain information on air movement and flow patterns in Mariposa County.

Data:

1. Continual wind direction monitoring stations.
2. Continual recording precipitation, temperature and evaporation stations.
3. Soil temperature stations.
4. Multi-pollutant monitering
5. High volume particulate sampling

Studies:

1. Effect of vegetation community modifications on insulation and re-radiation "vertical mixing" characteristics.
2. Temperature and inversion stability in closed basins.
3. Effects of basin generated particulates and oxidants on vegetation.
4. Relationship of valley air flow patterns to mountain terrain.
5. Effect of valley generated pollutants on Mariposa air quality.
6. Day/night air flow patterns.

This information, when developed for Mariposa County, will help to assist and inform decision makers in assessing potential air quality impacts and suggest measures to minimize a degradation of existing air quality conditions.

5.305

REFERENCES

1 California State Air Resources Board, 1981. Mariposa County Preliminary Emission Forecast.

2 California State Air Resources Board, 1980. California Air Quality Data Vol. 12

3 Mariposa County Air Polution Control District, Nonattainment Plan for Photochemical Oxidant.

4 Mountain Counties Air Basin, 1978. Implementation Plan.

5 Reible and Shair, 1981. The Origin and Fate of Air Pollutants in Californias San Joaquin Valley. Seminar given by Cal. Tech.

6 U. S. Dept. of Agriculture, 1974. Mariposa County Soil Survey. Soil Conservation Service.

7 U. S. Dept. of Commerce, 1978. Climatological Data - Annual Summary. NOAA

8. U. S. Weather Bureau, 1966. Climate and Plantclimate Map of Mariposa Co., University of California, Agriculture Extension Service.

5.400 BOTANY

5.401 INTRODUCTION

This section provides a brief overview of the plant communities and representative species found in Mariposa County. Although keys to identify specific species exist, Munz and Keck, 1973, no list of all plants located in Mariposa County has been compiled due to the numbers and diversity of floral species. Readers are urged to consult the reference section for a more in depth reading on Sierra botany, and a vegetation transect,Exhibit 5-B.

The vegetation of the Sierra Nevada and Mariposa County is recognized by Axelrod, 1977, as originating from two Paleo-floralistic provinces, the Arcto-Tertiary and Madero-Tertiary Geofloralistic communities. The communities developed in the Sierra Nevada in response to the equable climatic conditions of the Tertiary, Sierran uplift and development of a cold offshore current which resulted in the development of our present Mediterranean climate. This present day California Floralistic Province has provided us with an unique floral array typified by a relatively high incidence of endemics, plant species that have developed to specific climatic and environmental conditions. These endemics have survived due to three unique conditions:

1. The uplift of the Sierra Nevada provided protection from recent extreme continental conditions that developed during the Pliocene.

2. The uplift of the Sierra Nevada provided a continual slope that allowed species terrain for elevational migration in response to climatic changes thus preventing major floral extinctions.

3. Recurrent climatic fluctuations in a region of increasing edaphic, topographic and climatic conditions prompted outbursts of speciation.

A general setting of this new environment has been described by Axelrod and is presented here.

> "Early in the Tertiary, the region differed greatly in topography, vegetation and climate from that of the present. The high mountains that now dominate the landscape were not yet in existence. A tropical sea lapped against low hills at the site of the present Sierra Nevada and Klamath Mountain region, and also covered most of the Coast Ranges, The portion of California west of the San Andreas was then situated far to the south. The Cape region of Baja California was nestled against the coast of Nayarit near Cabo Corrientes; the east coast of Baja California lay against the present coast of Sonora/Sinaloa. The proto-Gulf of California did not appear until the Late Miocene when plate movements commenced. Southern California west of the San Andreas was then situated in the present area of norther Baja California. It was covered with tropical seas into the Late Miocene which flooded much of the area of the present Transverse Ranges and lapped against

the front of the low San Gabriel Mountains, thence swinging southwest in Riverside County to the present coastline, and then south along the coast of Baja California. In the Miocene and later, the entire area continued to shift northward in a series of complex movements distributed among several major faults of the San Andreas system (Karig and Jensky, 1972; Moore, 1973; Gastil and Jensky, 1973).

Fossil floras of Eocene and Early Oligocene age from Washington southward show that the coastal region was covered by dense rainforest. It lived under a warm temperate, per-humid climate in the north, grading into a subtropical savanna that thrived under monsoonal conditions in central and souther California. Fossil floras from this region are composed of tree ferns, cycads, and numerous large-leaved evergreen dicots of tropical and subtropical families chiefly, including Anacardiaceae, Arecaceae, Burseraceae, Fabaceae-Caesalpinioideae, Lauraceae, Meliaceae. Moraceae, Simaroubaceae, and Sapindaceae. A few taxa or temperate requirements are present and they increase inland, as shown by the appearance of Alnus, Carya, Cladastris, Metasequoia, Platanus, Quercus, Zelkova and others in eastern California, Oregon and Washington which contributed to a rich evergreen-deciduous hardwood forest farther inland.

There was a rapid change in forest compositon at the edge of the cordilleran region, stretching from central British Columbia southward through Idaho and into central Nevada, and down the Rocky Mountain axis through central Colorado and New Mexico. The region was one of discontinuous basins separated by low ranges with maximum summit levels near 1,500-1,800 m in eastern Nevada and Idaho. Mixed conifer forest lived at levels above 750-900 m, giving way to subalpine conifer forests near 1,500 m. These are the Eocene forests which contain taxa that are related to those that are now in the derived forests in California."[10]

5.402 PLANT COMMUNITIES

A. Prairie or Annual Grasslands

From the western county boundary to the Oak-woodlands this community of 180,000 acres was developed and is limited in growth by climatic conditions, hot dry summers, creating a pronounced soil moisture deficit, and cold, wet winters, see Climate Section 5.300. First appearing in this region during Eocene times, through a northward migration in response to climatic changes, this community was being utilized by herbivores during the Oligocene and experienced several regressions and expansions of territory.

An approximation of this floralistic community prior to the 16th century includes the following perennial grasses: Stipa pulchra, S. cernua, S. coronata, S. lepida, Elymus triticoides, Aristida divaricata, Poa scabrella, Koeleria cristata, Melica californica, and Muhlenbergia ringens.

Annual grasses present during this time included Aristida, Eragrostis, Escholtzia, Lotus, and Orthocarpus.

This floral array was subsequently modified through the introduction of alien species which has been divided into four states by Barbour and Majors, 1977.

"Hendry (1931) suggested that Erodium circutarium, Rumex crispus, and Sonchus asper may have preceded Europeans to California. Adobe bricks used to build the earliest Spanish missions contained these as well as Hordeum leporinum, Lolium multiflorum, and Poa annua, all introduced species. The earliest European arrivals to the Americas (Columbus, Cortes, Magellan, Coronado, and others) did not settle in California. However, seeds in packing and hay from Spain and in the debris associated with livestock on their sailing vessels undoubtedly were the sources of the alien plants. A brief land exploration, especially one with horses, from the first sailing vessel to reach the California shores probably left new plants. Many of the early ships carried a few live animals for meat; thus seeds in the manure thrown overboard could have resulted in alien plants reaching shore even though the sailors did not. Once a plant species produced seeds anywhere in the continent, birds could have carried them to other locations. California lies in the path of many bird migrations, especially north-south routes with one terminus in Mexico.

Burcham (1956, 1957) and Robbins (1940) presented evidence that suggests major replacement of the perennial grasses with introduced annuals in stages beginning in the 1850s. At that time, there appeared to be overgrazing in the coastal areas, and miners from all over the world had traveled to the gold fields, bringing seeds, bulbs, and cuttings of many plant species. Eleven years of drought caused much barren land. Perkins wrote in 1864, "Less than ten years ago, the traveller would ride for days through wild oats tall enough to tie across his saddle, now dwindled down to a stunted growth of six or ten inches, with wide reaches of utterly barren land," (as quoted in Burcham 1957). This statement suggest that Avena fatua and probably Brassica nigra invaded the Central Valley and became dominant before livestock had overgrazed the area. Similar botanical composition may be seen almost every year in the spring along the roadsides in the San Francisco Bay Area.

The second stage, about 1870, was dominated by Bromus spp., Erodium spp., Gastridium ventricosum, and Hordeum leporinum. Introduced annuals in the third stage, the 1880, included Aira Caryophyllea, Bromus rubens, Centaurea melitensis, Hordeum hystrix, and Madia sativa. A fourth group, Aegilops triuncialis, Brachypodium distachyon, Chondrilla juncea, and Taeniatherum asperum, has increased recently. Species not in California, such as Cryptostemma calendula, or cape weed in Australia, dominate Mediterrean-type grassland in other parts of the world. They have the potential to become part of the California annual grassland. Today Bromus mollis, which arrived about 1880, is the matrix species through much of the grassland, but it may not continue in that role."

Riparian areas presently include Fraxinus latifolia, Junglaus hindsii, Platanus racemosa, Populus fremontii and several species of Salix.

This community is utilized as forage for a number of species. Original inhabitants included Pronghorn Antelope, Tule Elk, Jackrabbits, Ground Squirrels, Kangaroo Rats and Gophers. As utilization of this area increased, primarily during the 1850s the larger wild animals diminished and "The maximum impacts of livestock grazing on the grassland came after many introduced species had arrived and made permanent places in the grassland vegetation".[1]

Vernal pools, a unique floral micro environment created by geologic, vegetative and climatic processes, see Mima Mounds in Geology, Section 5.100, can be found on many grassland areas near the western county boundary. These "hog wallows" are a series of mounds and depressions which collect rain water and develop a unique vegetation stratification from the basin to the crest of the mound. Due to the collection, percolation and evaporation of water, chemical characteristics of this micotopography, which vary from pool to pool,[2] differ from the surrounding relatively flat alluvium. These pools, often saline and or alkaline, can develop carbonate nodules at the bottom of the pool and are often underlain by a caliche or hard pan layer. This micro habitat has developed a vegetation of vernal pool edaphics that still retain the majority of native species including: Alopecurus howellii, Blennosperma nanum, Boisduvalia glabella, Brodiaea hyacinthina, Deschampsia danthonoides, Evax caulescens, Gratiola ebracteata, Isoetes orcuttii, Juncus bufonius, J. unicialis, Limnanthes douglasii var. rosea, Lilaea scilloides, Allocarya stipitata, Lythrum hyssopifolia, Navarretia intertexta, Psilocarphus brevissimus, and several species of Downingia, Eryngium, and Lasthenia, as well as most species in the unusual grass genus Orcuttia.

These vernal pools are being destroyed throughout the central valley and constitutes a sensitive environment in need of more research.

Areas of this community that need future study include:

1. The spatial variation of grassland species to climate.
2. The rate of organic matter accumulation and decomposition.
3. Studies of the competition between perennial and annual herbaceous plants.
4. Impacts of grazing animals.

B. Foothill Woodland

Presently comprising approximately 190,000 acres of Mariposa County this community is derived from the Madero-Tertiary Floralistic Region as described by Axelrod.[9] Established during mid Eocene times, this floral distribution has undergone a series of range fluctuations during the Miocene and Pliestocene. The present foothill woodland seldom forms a

continuous cover over large areas and is viewed as a major grouping of a mosaic of sclerophyllous vegetation which includes the chaparral and grasslands. Three phases or units of oak woodlands can be identified[1] in Mariposa County, the Blue Oak Association; Q. douglasii and P sabiniana, the interior live oak phase; Q. wislizenii, and the Black Oak unit, Q. kelloggii, Q. chryolepis which contains several species of Pinus. Riparian trees include Acer macrophyllum, Aesculus californica, Alnus rhombifolia, Plantanus racemosa, Populus fremontii and Umbellularia californica. The understory consists of grassland and chaparral elements including Rhus diversiloba, Arctostaphylos and Ceanothus. Variations in vegetation are recognized to be a function of available water and rooting depth. The following excerpt from Barbour, 1977, amplifies this relationship.

> "The xerophytic appearance of lowland oak communities matches that of upland woodlands, and soil drought during the summer is severe in both situations for shallow-rooted herbs. But for deep-rooted trees, large differences in water availability can exist in different topographical positions, often within short distances.
>
> A relationship between large Quercus lobata trees and bottomland soils with shallow water tables was assumed in the older literature. Jepson (1910) pictured the best Q. lobata habitat as a fertile loam with water at depths of 3-12 m. Cannon (1914) thought that this oak reached its best development with water tables 3-6 m deep. In the Palo Alto region, Cooper (1926) studies Q. lobata distribution and water table depths in wells. Oaks were absent on higher terraces with water tables 9-55 m deep, whereas lower terraces with water tables 0-35 m deep supported both Q. lobata and Q. agrifolia. He found no close correlation between water table depth and oak dominance, but on any given terrace "with increasing depth to water the oaks sooner or later give way to chaparral." Cooper thought that Q. lobata had the deeper root system of these two oaks.
>
> Lewis and Burgy (1964) studied the rooting depths of several oaks in Placer Co. foothill woodland. On deeply fractured metamorphic rocks, they found Q. douglasii and Q. wislizenii utilizing water from depths of at least 21 m during the summer. They stressed the importance of water tables to all oaks in all California situations.
>
> Water table or rooting information, however, is rarely available for woodlands. Estimating the available soil moisture, even down to 1 or 2 m, during the peak of the summer drought has been tried in only a few woodlands in California. Waring and Major (1964) found that the soils of northern oak woodland supplied much less water than the adjacent mixed evergreen forest and redwood forest soils in Humboldt Co. Cooper (1972) suggested that northern oak woodland plots on Tyson soil had more available moisture than grassland on Yorkville soil but less than forest on Hugo soil. Several foothill woodland plots in Shasta Co. had much less available mositure than adjacent mixed conifer forest (Griffin 1967).

Severe limitations on soil sampling throughout the rooting zone have made pressure chamber sampling of oak corwn far more helpful in estimating moisture stress than soil sampling under the trees (Griffin 1972; Snow 1972; Syvertsen 1974; Waring 1969). Pressure chamber studies in alluvial habitats at Hastings suggest that both Q. lobata and Q. agrifolia exploit the water table. Their predawn xylem sap tension only declines from -2 to -5 bar during the dry season, levels similar to those for riparian trees. In mid-August of a very dry season, alluvial Q. lobata trees had a predawn xylem sap tension of only -4 bar, whereas an adjacent upland stand of Q. douglasii trees had a tension of -27 bar (Griffin 1972). The blue oak phase has higher moisture stress during the summer than any other oak community at Hastings. In very dry years, Q. douglasii trees become drought deciduous in late August or September, dropping much of their foliage when the predawn xylem sap tenison drops below -35 bar (Griffin 1973).

Stand density influences moisture stress on uplands where the total water supply is limited. At Hastings, dense Q. douglasii stands (Table 11-6) have greater moisture stress than stands with widely spaced trees. The drier the season, the greater is the density effect (Griffin 1973)."[1]

According to Dr. H. Latimer there has been no substantial oak seedling germination in the oak woodland for 75 years. This has affected the density and range of the deciduous oaks and is threatening the existence of this community, as of yet no specific information has been developed on the cause. Barbour, 1977 states that:

"Live oak seedlings may be more browse resistant than the deciduous oaks (Griffin 1971a), or pocket gophers may prefer the roots of deciduous oaks to those of live oaks. In any case, live oaks have been more successful in producing saplings in recent decades.

Heavy damage to acorns and seedlings by cattle, deer, rodents, and insects explains most of the failure of deciduous oak seedlings (Griffin 1971a, 1976; Snow 1972). It is easy to document the difficulties of getting deciduous oaks past the seedling stage now; what is needed is an explanation of how these oaks managed to form saplings in the past, for in several regions deciduous oak regeneration was locally abundant before 1900 (Bauer 1930; Brooks 1971; Griffin 1971a, 1976; Snow 1972; White 1966). Favorable combinations of acorn supply, spring precipitation, and low pressure from acorn and seedling predators must have been involved. White (1966) suggested that deer populations were low then, and disastrous droughts may have temporarily reduced cattle grazing. One very important seedling predator is the pocket gopher (Griffin 1971a, 1976), but we have no information about fluctuations of gopher populations in the past."

In June of 1979 a symposium on the ecology, management and utilization of California oaks was held in Claremont, California. This conference[14] produced the first collection of important research on Quercus spp., is considered required reading and is incorporated by reference.

The following is a list[6] of vegetation typical of woodland habitat: Pinus Sabiniana, P. Coulteri in upper parts, Quercus Douglasii, Q. chrysolepis, Q. agrifolia, Q. Wislizenii, Q. lobata, Umbellularia californica, Aesculus californica, Rhamnus californica ssp. tomentella, Ceanothus cuneatus, Cercis occidentalis, Ribes quercetorum, Eriodictyon californicum.

Areas of the oak woodlands that need future study include:

1. Details on floristic composition and stand structure.
2. Successional Trends.
3. Fire dynamics.
4. Studies on age-class distribution.
5. Water relations and photosynthetic efficiencies of evergreen versus deciduous oaks.
6. The physiological basis for browse resistance of oaks.
7. The specific role of small mammals in acorn and seedling predation.
7. The inter-relationship of pocket gophers with the community.

C. Chaparral

This community, which is considered the most highly valued watershed cover of any vegetation in the state,[1] covers approximately 41,000 acres of Mariposa County. This member of the Madro-Tertiary Geoflora assumed dominance in the Mid-Pliocene by displacing the decidous hardwood forest that had dominated through the Miocene. Following the Plistocene Epoch, the last period of a warm - dry system following Glaciation, called the Xerothermic period, shaped this community to its present distribution.[1] This distribution was further modified by two factors as stated by Barbour.

> "Axelrod (1958 and Chapter 5) has amassed a body of fossil evidence to support his claim that fire and summer drought were the major environmental agents that shaped California chaparral over the past 2+ million yr. Jepson (1930) suggested that fire played a leading role in chaparral speciation. The positive influence of fire in the evolution of chaparral has also been posed by Sweeney (1956). Vogl (1967) postulated that fire helped shape three-fourths of California's vetetation, including chaparral. Mooney and Dunn (1970) outlined the convergent evolutionary strategies of Mediterranean climate type sclerophyll shrubs and included fire as one of the major environmental stress factors. Fire caused by man has played a profound role in shaping our current chaparral landscape (Zivnuska 1968). The early role resulted from aboriginal burning. This was intensified by the practices of the Mexican rancheros, who followed the Spanish tradition of burning off the hills. The gold rush of 1849 opened up even more extensive burning and was followed by a whole wave of complex human impacts on the land, including deliberate burning.

The dominant woody genera of the California chaparral, such as Adenostoma, Arctostophylos, Ceanothus, Heteromeles, and Rhus, are absent from other regions having a Mediterranean type climate. Indeed, botanists have concluded that the entire California chaparral evolved in place (Axelrod 1958; Stebbins and Major 1965)."

Five subtypes of this community are identified in Mariposa County. They are:

1. Chamise Chaparral

   This type is dominated by Adenostoma fasciculatum and constitues a dense interwoven vegetation to three meters in height without understory. Regrowth after fire is slow and regrowth after 25 years can reach 90%.

2. Ceanothus Chaparral

   This sub unit is both a sucession and a climax form and is usually found as relatively pure stands and may be codominant with Arctostaphylow spp. This community frequently occurs as understory when oak woodland or yellow pine forest is climax.

3. Manzanita Chaparral

   This unit generally occurs on deeper soils and at higher elevations where freezing moisture and snow provide the major form of precipitation and can in 50 years develop 100% cover.

4. Montane Chaparral

   Serves as a low to medium understory to coniferous elements or as a successional stage after fire or logging. This is the primary understory of the yellow pine forest in Mariposa County.

5. Serpentine Chaparral

   This unit contains elements of Madro-Tertiary vegetation which through adaptation have been able to adjust to specific physical and chemical conditions present in the substrate and soil derived from it. Ornduff[8] lists several characteristics of serpentine soil that influence plant growth.

   "Characteristics of serpentine soils in California that are unfavorable to plant growth are:

   1. Serpentine soils have a very low calcium content and a correspondingly high magnesium content. Calcium and magnesium are both essential nutrients in the metabolism of plants,

but plants are unable to take up sufficient calcium through their roots when magnesium is present in excessive quantities. The result of this imbalance may be stunted growth of plants due to a combination of calcium deficiency and magnesium toxicity. By addition of calcium salts, serpentine soils may be rendered relatively amenable to agricultural use.

2. Serpentine soils also frequently have a high nickel and chromium content. These mineral elements are not only unnecessary for plant growth, but are toxic to plants even in small quantities.

3. Serpentine soils are low in the content of nutrients, such as nitrogen, that are required in relatively large quantities by most plants for adequate growth. In addition, they are deficient in many other nutrients, such as molybdenum, which are equally essential to plants but are needed in smaller quantities.

4. Serpentine soils often are waterlogged in the winter and excessively dry in the summer season. The transitional periods between being very wet and being very dry may be quite short, with the result that a perennial plant growing on serpentine soil must be able to tolerate very wet soil during some seasons of the year and very dry soil during other seasons. Such extremes in water content also may be characteristic of other soil types in California, but few other soils offer as well the peculiar set of characteristics of mineral composition."

The dominant shrubs are Adenostoma fasciculatum and Heteromeles arbutifolia with Pinus sabiniana on the contact zone between rock units and sparsely represented on the serpentine. Howard Latimer recognizes that this soil type, derived from the serpentine represents an area which still supports the majority of native grasses and forbs due to the inability of alien species to adapt to the specific characteristics present in the soil.

An alleopathic effect, the ability for a type of vegetation to produce water soluble phenolic compounds that inhibit understory plant growth, that is characteristic of chaparral species produces oils that during a fire, migrates into the soil horizon and forms a layer which precludes water percolation. When rain occurs the water is concentrated in the soil which when slope, soil particle size, and other conditions are met, soil movement occurs resulting in localized landslides.

Barber, 1977 dealt succinctly with animal habitation on chaparral and his comments are as follows:

"Numerous rodents inhabit chaparral (Wirtz 1974), and their populations are greatly reduced by fire (Howard et al. 1959; Chew et al. 1959; Cook 1959; Lawrence 1966). Some brushland rodents avoid recently burned sites (Cook 1959; Wirtz 1974). Burrowing rodents and reptiles survive a chaparral fire if they are several centimeters below ground (Lawrence 1966). Birds and large mammals can move away from the fire unless trapped by the flames (Wirtz 1974). Mule deer exhibit a preference for more open foraging areas over relatively mature stands of chaparral. Unlike the eastern white-tailed deer, mule deer take much more grass and herbage in their diet and are therefore attracted to the herbage of chaparral in early stages of secondary succession (Wirtz 1974). Their foraging on shrub seedlings and sprouts may have a significant effect on the recovery rate and composition of chaparral (Biswell and Gilman 1961; Kinucan 1965; Davis 1967), but little is known of bird and rodent influence on the early stages of chaparral succession."

The following is a list of vegetation typical of chaparral communities.

Adenostoma fasciculatum, Heteromeles arbutifolia, Rhamnus californica, R. crocea, Quercus dumosa, Cercocarpus betuloides, Fremontia californica, Prunus ilicifolia, Ceanothus spp., Arctostaphylos spp., Pickeringia montana and Trichostema lanatum.[6]

D. Yellow Pine Forest

Axelrod has established that this relic from the Mid-Miocene introduction of Arcto-Tertiary flora has only been established quite recently on a subzone that due to climatic conditions provided opportunities for specie radiation. Axelrod states,

"This enabled numerous plant genera to proliferate new species adapted to these narrower, and certainly more unstable, subzones where extinction rather than persistence seems more likely to occur as moister climates appear again. Stebbins and Major (1965) have particularly emphasized the critical role of such ecotonal situations in the origin of the recently derived endemics of California."[10]

Barbour, 1977 offers a brief description of vegetation typical to this community...

"Associated with P. ponderosa at lower elevations, especially in ecotonal areas with Coulter pine forest, are P. coulteri and Quercus kelloggii. Under more mesic conditions, as on upper north- or east-facing slopes of canyons, associated trees are Pseudotsuga macrocarpa, Calocedrus decurrens, Quercus chrysolepis, and Cornus nuttallii of the souther mixed evergreen forest. At higher elevations on more mesic slopes, ponderosa pine mixes with

Abies concolor and Pinus lambertiana. Shrubby undergrowth in the open forests is rather limited, with generally only scattered specimens of Arctostaphylos glandulosa, A. pringlei ssp. drupacea, Ceanothus integerrimus, Eriodictyon trichocalyx, Garrya flavescens, Lupinus excubitus, L. formosus, Rhammus californica ssp. cuspidata, Ribes roezlii, and Solanum xanti, among others.

Perrenial and annual herbs in the ponderosa pine forest are represented by numerous species, often presenting an attractive display at different times in the growing season. Species common here but not usually found in the Jeffrey pine forest are Calystegia occidentalis ssp. fulcrata (= C. fulcrata), Carex multicaulis, Clarkis rhomboidea, Collinsia childii, Cordylanthus filifolius, Eriastrum densifolium ssp. austromontanum, Gilia splendens ssp. grantii, Iris hartwegii ssp. australis, Linanthus ciliatus, Phacelia imbricata ssp. imbricata, Silene lemmonii, Streptanthus bernardinus, and Viola purpurea ssp. purpurea. Common native perennial grasses of the open forest are Bromus breviaristatus, B. orcuttianus ssp. hallii, Koeleria macrantha, Melica imperfecta, and Poa scabrella. Many of the most representative pineland species, however, appear equally at home in both yellow pine forests, as Arceuthobium campylopodum, Asclepias eriocarpa, Castilleja martinii, Chaenactis santolinoides, Chimaphila menziesii, Galium johnstonii, Gayophytum heterozygum, Lotus davidsonii, Mimulus johnstonii, Penstemon grinnellii, P. labrosus, Sarcodes sanguinea, and Sitanion hystrix."

Daubenmire recognizes that the understory of P. ponderosa is quick to multiply following fire and logging and with repeated disturbance thickens until natural invasion of P. ponderosa is extremely slow. This community previously extended to a lower elevation. Due to disturbance by man, plant successional characteristics, and climate, the P. ponderosa forest has not been able to re-establish in the lower marginal transition zones.

Barbour discusses floral ecology of this community and the relationship of fire to succession in the following;

"Pinus ponderosa and Quercus kelloggii are well adapted to light, regular ground fires. Seedlings of P. ponderosa are intolerant of shade in comparison to Abies concolor and Calocedrus decurrens, resulting in poor establishment of the former in dense stands. Where undergrowth of young trees is regularly thinned by ground fires, P. ponderosa becomes established and dominates. Typically, P. ponderosa increases in density as total stand density decreases, whereas the reverse relationship is typical for fire-intolerant A. concolor, C. decurrens, and P. lambertiana (Sellers 1970). Seedlings of P. ponderosa are intolerant of deep snow (Neal, upub. data), and this factor may also be important in explaining its relative abundance.

Quercus kelloggii, adapted to fire by crown sprouting, decreases in importance in dense stands. Although this oak is moderately shade tolerant in its early stages of growth, it requires full sun for good growth when mature (McDonald 1969). It seems to have been virtually eliminated by shading from dense stands of Calocedrus decurrens in the Yosemite Valley (Gibbens and Heady 1964). The seedling abundance of Q. kelloggii is extremely high in relation to sapling and tree densities: Sellers (1970) counted 8800 seedlings per hectare in a stand with only 47 sapling and tree oaks per hectare. Seedling mortality is high, and growth during the first 25 yr (ca. 10 cm dbh) is slow, followed by a period of increase in diameter. Growth slows as trees reach maturity at about 90 yr, and few trees attain ages in excess of 350 yr (McDonald 1969). Although mature Q. kelloggii is intolerant of poor drainage or relatively mesic soils with poor aeration (McDonald 1969), it is extremely drought resistant and may grow on sites too poor for P. ponderosa (Sellers 1970).

Abundant evidence indicates that Calocedrus decurrens and Abies concolor have both increased their relative and absolute densities in ponderosa pine forest since the turn of the century, when fire control programs became widespread and effective in the Sierra (Vankat 1970). Seedlings of C. decurrens and A. concolor are highly tolerant of shade, readily become established in plots with light litter or brush cover (Fowells and Schubert 1951) and thus are favored in dense stands. Once released from shade, they grow rapidly in height (Mitchell 1918), although more slowly than associated coniferous trees (Dunning 1923). Sellers (1970) reported that trees 60-90 cm dbh were 155-240 yr old in Kings Canyon, but Sudworth (1908) gave ages of 360-546 yr for the same diameters. Once trees reach height maturity (45-60 m at 165-210 yr of age), they are subject to severe dry rot infections (Boyce 1920).

Mean ground cover, density, and basal area data for 12 stands of ponderosa pine forest in Sequoia National Park are shown in Table 17-2. Total tree cover ranged from 60 to 95% for the 12 stands, and basal area ranged from 26 to 172 $m^2 ha^{-1}$. Herb cover (not shown in the table) was slight, varying between 0.1 and 1.0%. Shrub cover and diversity were extremely variable among stands, but the characteristic species were Chamaebatia foliolosa and Arctostaphylos viscida (A. patula at higher elevations). These and other shrub species are favored by fire, and are eliminated by shading in dense older stands. Historical records indicate that shrub density and cover in ponderosa pine forest have decreased with fire suppression policies in the twentieth century (Vankat 1970).

The high densities of Calocedrus decurrens, particularly evident in Table 17-2, reflect recent increased establishment. Continuation of fire supression policies in the future will further shift the dominance in ponderosa pine forest to Calocedrus on more xeric sites and to Abies concolor on more mesic sites."

E. White Fir/Mixed Conifer

Barbour and Majors[1] offer a concise overview of this flora in the following exerpt:

"White fir forest forms the dominant community on relatively mesic sites in the lower montaine zone of the Sierra Nevada. Depending on latitude, this community occurs from 1250 to 2200 m. Although Abies concolor is the dominant species, up to six species of conifers may be present in individual stands - hence the common use of the name "mixed conifer" forest. White fir is the overwhelmingly dominant species, while Pinus lambertiana and Calocedrus decurrens are important associates, and Sequoiadendron giganteum may be dominant in terms of basal area in local groves (Rundel 1971). Community data for stands in Sequoia National Park are shown in Table 17-3. In the northern Sierra and southern Cascades, especially at 1200-1500 m, A. concolor is much less dominant, and Pseudotsuga menziesii is the prominent member of the community (Table 17-4, Fig. 17-2). At lower elevations and on drier sites at higher elevations, A. concolor may share dominance with C. decurrens, and Pinus ponderosa and Quercus kelloggii are important associates. Near the upper margin of the white fir forest, A. concolor mixes with A. magnifica in a transition to red fir forest communities.

The structure of individual stands within white fir forests is highly variable. This situation is due to the complex dynamics of stand mosaics, resulting from different fire histories and variation in rate of development on individual sites. Individual stands, varying from a few trees to a hectare or more in size, represent relatively even aged stands in varying levels of successional development. Older trees are typically uniformly dispersed, but younger ones show contagious patterns of dispersion (Bonnicksen 1975). Giant sequoias clearly show a highly contagious pattern of dispersion throughout their lives.

Abies concolor commonly comprises 80% or more of the large trees in individual stands of white fir forests (Rundel 1971; Schumacher 1926). Mature trees of this species are commonly 50-63 m in height with diameters of 1-2 m or more, and probably reach ages of 300-400 yr. Although precipitation diminishes gradually from north to south in the Sierra Nevada, the population distribution of trees by diameter class is very similar in the central and souther Sierra (Fig. 17-3). Satistics for pure, even-aged stands of white fir are shown in Table 17-5. The literature on A. concolor is extensive and has recently been summarized by Bonnicksen (1972).

Pinus lambertiana, only rarely found in pure stands, is a typically important associate in white fir forests. With the exception of giant sequoia, P. lambertiana is the largest member of the community,

reaching heights of 78 m and diameters of 3.1 m. Seedlings germinate on both litter and bare mineral soil, but development is slow under shade conditions (Fowells 1965).

Understory trees and shrubs form an important element in white fir forest. The most significant aspects of this understory layer are the dense thickets of white fir and incense cedar saplings that have developed in this century in response to decreased fire frequency. Although total understory tree and shrub coverage is extremely variable, coverages of 5-10% are common, and values to 30% or more are not unusual. At lower elevations or on rocky sites, Acer macrophyllum, Quercus kelloggii, Q. chrysolepis, Arctostaphylos patula, Chamaebatia foliolosa, Ceanothus integerrimus, C. cordulatus, and C. parvifolius are common; many of these are favored by frequent fires. Corylus cornuta var. californica and Cornus nuttallii are restricted to relatively mesic sites and may be common in giant sequoia groves. Other shrub species occurring less commoningly are Salix xcouleriana, Castanopsis chrysolepis, Prunus emarginata, and Ribes ssp.

A final consideration here is the impact of human activities. Soil compaction and physical trampling eliminate many native species and often lead to the introduction of weedy invaders. Many studies have described the impact of man on white fir forest communities in giant sequoia groves (Rundel 1967; Hartesveldt 1962, 1967; Meinecke 1926). Beetham (1963) demonstrated that recreational and logging disturbance increased the relative densities of Calocedrus decurrens seedlings at the expense of Abies concolor and Pinus lambertiana seedlings. Recent documentation of oxidant-induced air pollution damage to mixed conifer forests points to an extremely serious development in California mountains (Miller 1973). Abies concolor, P. ponderosa, and P. jeffreyi are the species most sensitive to this type of oxidant damage.

F. Red Fir

"The red fir forest lies immediately above the montane mixed conifer forests, in an elevational band about 300 m wide. The lower and upper limits of this band are about 1800 and 2750 m, varying with latitude and local influences. The range extends from northern Lake Co. northward through the North Coast Ranges, and from the southern Sierra Nevada (Kern Co.) to the southern Cascade Range and northward into southwestern Oregon.

Snow is the characteristic form of precipitation, packs usually reaching depths of 2.5-4+ m. The top of the snow pack is marked by the lower limit of Letharia vulpina and L. columbiana on tree trunks. Annual precipitation is commonly 1000-1300 mm. There is usually some rain in fall and spring, but summers are dry except for infrequent, locally intense convectional (thunder) storms.

Abies magnifica is the overwhelmingly dominant species in red fir forests, often occuring in pure, dense stands. At its lower elevational limits, however, it is often equally mixed with A. concolor, but

hybridization does not occur. On moist soils above 2500 m, red fir commonly shares dominance with Pinus contorta ssp. murrayana. Basal areas for 10 red fir communities in Sequoia National Park ranged from 74 to 112 m^2ha^{-1} (Vankat 1970).

Studies of red fir forests in the southern Sierra Nevada are restricted to Kings Canyon National Park (Kilgore 1971) and Sequoia National Park (Vankat 1970; Hammon-Jensen-Wallen Forestry 1970). More detailed comparative data on community structure is available for red fir forests in the northern and central Sierra Nevada (oosting and Billings 1943), and limited data for Yosemite National Park (Heath 1971). These data are shown in Table 17-6. Pinus monticola is a constant associate of A. magnifica in the northern and central Sierra, but becomes much less common in the southern Sierra. Pinus lambertiana, P. jeffreyi (on rocky sites), Tsuga mertensiana, and Calocedrus decurrens are occasional associates.

The stand structure is commonly dominated by even-aged (established within a 20 yr period) groups of trees. Uniform stands may vary in size from a small fraction of a hectare to several hectares. Some stands which appear to be uneven aged are found upon close examination to be even aged by small groups, or to be two storied. The principal sources of quantitative information on even aged red fir stands are Schumacher (1928) and Dunning and Reineke (1933); summary statistics appear in Table 17-7.

Where Abies magnifica seedlings have an opportunity to become established, the most favorable microsites are filled by the first wave or two of seedlings from heavy seed crops. Additional seedlings may become established later for an indeterminate period, but most will eventually die. With time, the first wave of seedlings will become the dominant trees in a new stand. Snow suppression and competition for soil moisture constantly reduce the number of plants, and stand closure at the sapling stage eliminates nearly all the low vegetation.

Natural regeneration may occur in small openings where soil moisture becomes available after the death of one or a few old trees, or on larger areas created by wind damage, insect epidemics, fire, or logging. Seedlings become established best on mineral soil or litter less than 8 mm deep (Gordon 1970). Seedlings grow to a height of only 10-15 cm during the first 2-4 yr. If established where they remain badly suppressed by larger trees, they may grow only 3 cm a year for 60-80 yr or more (Gordon 1973). If established so as to have free growth from the beginning, after the 2-4 yr slow growth period they will attain a height growth rate of 20-30 cm yr^{-1} during the sampling stage.

Some shrub species remain until tree stems reach diameters of 15+ cm, but generally shrubs tend to dominate only areas that have been subject to hot fires. The most common brushfield species are Ceanothus veluntinus, C. cordulatus, Arctostaphylos patula, Ribes roezlii, Chrysolepis sempervirens, Prunus emarginata, and Salix scouleriana, with Quercus vaccinifolia appearing on less fertile sites.

Abies magnifica often replaces lodgepole pine after fires. Large individuals of lodgepole pine that survive fires are highly susceptible to bark beetle damage. Under such conditions, the reproduction of A. magnifica is abundant, whereas lodgepole pine seedlings are restricted to openings and disturbed sites. The natural succession from pine to red fir is tremendously accelerated by bark beetle activity.

More commonly than any other species, lodgepole pine dominates scattered small areas within the red fir forest. Such areas often appear to be the result of small lightning-caused fires that killed fir trees and created a mineral seedbed at a time fortuitous to catch a seed crop from nearby pines. Such areas are transient, since fir regeneration is good under pine, and eventually firs (perhaps after 100-200 yr) overtop and kill the shorter and less tolerant pines. Other lodgepole-dominated areas are principally associated with shallow water tables near streams and meadows or on benches. In some of these areas, mixed stands have a visually grouped species distribution in other, a more open and mixed appearance.

Understory vegetation is often slight in red fir forest because of the dense canopy which cuts out light and builds up a deep acccumulation of litter. In many cases the understory flora closely resembles that of the lower white fir forest. Oosting and Billings (1943) found that Ribes viscosissimum was the most constant shrub in the northern and central Sierra, while Symphoricarpos vaccinoides was present in about half their stands. Densely shaded stands typically support an open herbaceous cover of less than 5%, dominated by Hieracium albiflorum, Poa bolanderi, Corrallorhiza maculata, Chimaphila umbellata, Pedicularis semibarbata, Chrysopsis breweri, Pyrola picta, P secunda, Sarcodes sanguinea, and Pterospora andromeda. Openings with coarse, gravelly soil typically support denser covers of Arabis platysperma, Viola purpurea, Eriogonum nudum, Gayophytum nuttallii, Mondardella odoratissima, Calyptridium umbellatum, Sitanion hystrix, and Wyethia mollis."[1]

G. Lodgepole Pine

"Above the red fir zone, forest communities become more open and the trees are of shorter stature. Lodgepole pine (Pinus contorta ssp. murrayana) dominates the zone commonly found immediately above the red fir forest. In the northern Sierra, lodgepole pine occurs at 1830-2400 m but rises to 2440-3350 m in the south. The lodgepole forest is characterized by open stands with sparse litter accumulation and little shrub or herbaceous understory. Although it may intermingle with the red fir or mixed conifer forest below and subalpine forest above (occasionally even reaching up to tree line), it is most frequently found in extensive even-aged closed or open stands around meadows or moist areas. It is common on glacially scoured basins, where it colonizes joint planes on which soil has accumulated. With soil development, it may in time be replaced on these sites by Abies magnifica.

The lodgepole pine zone in the Sierra is characterized by an annual precipitation of 750-1500 mm, most of which falls as snow in the winter months. The growing season is short (2-3 mo), and temperatures are frequently cold. The stature and density of the trees are a function of the richness and depth of the soil and the protection of the habitat. With deep soil and a well-developed humus layer, lodgepole pine will grow in dense stands with individual trees reaching up to 30 m in height and 0.6-1.3 m dbh. On thin, poor soils of open granite slopes and exposed ridges, the tree occurs in widely scattered dwarfed forms. On the relatively thin granitic soils much of the higher-elevation Sierra, it commonly attains a height of no more than 15-20 m. Although little ecological work has been done with lodgepole pine in the Sierra, considerable autecological and synecological research has been carried out with Pinus contorta ssp. latifolia in the Rocky Mts.(Baumgartner 1975).

In Sequoia National Park, Vankat (1970) sampled nine stands between 2600 and 3100 m. Lodgepole pine accounted for almost all of the ground cover. Total cover averaged 56%, lodgepole density averaged 3390 trees per hectare (including saplings), and lodgepole basal area averaged 58 $m^2 ha^{-1}$. An age analysis of a closed lodgepole forest in Kings Canyon National Park (Hammon-Jenson-Wallen Forestry 1970) revealed a bimodal distribution, with 50% of the trees in the seedling-sapling category and 20% in the 35-45 cm dbh class. Very few trees were over 65 cm dbh. Average tree height was 30+ m. Shrubs are generally of little important in lodgepole forests, but such species as Arctostaphylos nevadensis, Ribes montigenum, and Phyllodoce breweri are locally abundant.

Lodgepole pine is extremely successful in meadows and other moist areas, in addition to dominating open basins and ridges. Dense thickets of lodgepole commonly invade the peripheries of meadows. The invasion of many high Sierra meadows by lodgepole pine in recent years is a poorly understood phenomenon. One hypothesis is that lodgepole pine has only recently been able to grow freely in these areas, after years of effective suppression, first by natural and Indian-caused fires and more recently by the grazing of domestic sheep. The elimination of such disturbances during the present century has allowed for a high level of lodgepole reproduction in the meadows.

Physiological studies conducted on lodgepole and foxtail pines in the Rock Creek area of Sequoia National Park (Leonard et al. 1968) showed lodgepole pine to be a flood-tolerant species with remarkable control of its internal water balance over a wide range of soil moisture conditions. It is able to increase water uptake and transpiration rates much more rapidly than foxtail pine, and by several times as much, when placed under wet conditions. Sites that remain saturated throughout the growing season do not support lodgepole pine, however.

Vankat's (1970) study of vegetation change in Sequoia National Park showed a general increase in density and cover of lodgepole pine in the past half-century. There was extensive lodgepole reproduction sometime after 1900 in both mature stands and meadow peripheries. Periodic fires which served to keep lodgepole forest open before are no longer allowed to burn, preventing the thinning of young growth by fire and resluting in unnaturally heavy fuel accumulation. If continued, this trend may lead to a general degradation of the community or succession, leading to dominance by Abies magnifica.

In an effort to reintroduce fire in something approaching its natural role in these areas, the National Park Service has undertaken a program to allow lightning fires to run their course (Kilgore and Briggs 1972). Only areas where fuel accumulation has been low enough that fires can be safely allowed to burn are included in these Natural Fire Management Zones. Over 4000 ha of high-elevation forest in Yosemite, Sequoia, and Kings Canyon National Parks has burned under this program since 1973.

H. Subalpine Forests*

"Above the lodgepole forest is the subalpine forest, composed of widely spaced conifers from 25+ m in height to short, drummholz forms. Although occasionally intermingling with the lodgepole and red fir forests below, the subalpine forest associates are most commonly found between 2400 and 3050 m in the northern Sierra and between 2900 and 3660 m in the south. Characteristic species include Tsuga mertensiana, Pinus albicaulis, and P. balfouriana, and occasionally P. monticola, P. flexilis, and Juniperus occidentalis ssp. australis (Griffin and Critchfield 1972; Hudson 1933; Kylver 1931).

The subalpine forest zone is characterized by an annual precipitation of 750-1250 mm, which, except for an occasional summer thunderstorm, falls entirely as snow. The growing season is short, frequently no more than 7-9 weeks, and frosts can occur at any time of the year. Wind can be severe, especially on exposed ridges at higher elevations. Soils in this zone are relatively undeveloped, with little or no humus. The parent material is often simply decomposed granite, resulting in shallow, coarse-textured, quick-drying soils. All of the common tree species attain ages measurable in hundreds of years, and the foxtail pine is known to reach an age of nearly 2000 yr (Mastroguiseppe 1972). Litter and fuel accumulations are low; thus the impact of fire is minimal. Little shrubby vegetation is found in these communities, although Salix ssp., Vaccinium occidentalis, V. nivictum, and Kalmia polifolia are common around meadows and moist sites. Occassional shrubs include Ribes cereum, Holodiscus microphyllus, and Artemisia tridentata.

Mountain Hemlock. Tsuga mertensiana is probably the most common representative of the subalpine forest in the northern Sierra. It grows as an erect tree, up to 30 m tall, in extensive groves southward to Yosemite. The Tsuga forest may be dense and dark, with a sparse ground flora.

South of Yosemite, T. mertensiana becomes increasingly limited to cold, moist slopes and high valleys at elevations above 2600 m (Parsons 1972), commonly in small stands at the heads of north- or east-facing canyons or in sheltered ravines where snow lingers well into the summer. These sites are characterized by shade and abundant soil moisture. These scattered southern stands, unlike the pure groves to the north, are commonly interspersed with such species as Pinus contorta ssp. murrayana, P. monticola, P. balfouriana, and Abies magnifica. At the southernmost known locality, below Silliman Lake in Tulare Co., a grove of about 60 trees contains individuals with heights as great as 24 m and diameters up to nearly 90 cm (Parson 1972), dimensions approaching those found in dense forests to the north. The stand is also characterized by a number of young individuals.

Western White Pine. Pinus monticola is moderatley abundant on the west slope of the Sierra, scattered in small groups and often interspersed with other species, throughout the subalpine forest zone. A common associate of red fir, lodgepole pine, and mountain hemlock forests in the central Sierra, P. monticola is more likely to be found in small groves of well-developed large trees on dry, exposed granite slopes to an elevation of 3400 m in the south. If given adequate shelter, it will grow as an erect tree nearly to tree line. Table 17-9 summarizes a typical stand of western white pine, 24-27 m tall, in what is now Kings Canyon National Park.

Whitebark Pine. The most typical tree line conifer of the Sierra Nevada is probably Pinus albicaulis, though it is also frequent in pure or mixed stands with lodgepole or foxtail pines at lower elevations (see Table 17-10). Growing in areas where glacial scouring has eliminated most of the soil, the trees are generally small in stature (10-15m), of candelabra form if erect, and often with gnarled or twisted branches, as on the southwest flanks of Mt. Tallac in the Lake Tahoe region (Smiley 1915).

In more exposed areas, whitebark pine forms stunted, multistemed trees. High on wind-swept slopes and ridges at tree line, they form low mats not more than 1 m high. Growth is very slow: a 12 cm long branchlet on P. albicaulis may be as much as 17 yr old (Storer and Usinger 1963), and a tree 43 cm dbh was found to be 800 yr old (Arno 1967)."[1]

*This community is in the scope of this report included in the Alpine community as noted on the transect.

I. Alpine

This community was developed late in Pliocene times when Sierran uplift exceeded the tree line and contains species of plants found north to the Artic Circle. Here deep snow, temperature, wind dissection, rock falls, moisture, solar radiation and subnival rodent activity combine to create a very specialized environment.

The following brief classification from Barbour is derived from an association of individualistic species that typify specific ecological conditions found in this community.

Three types of sub-communities have been recognized as existing in the Alpine Community.

1. A. Antennaria alpina - Carex vernacula meadow which in addition contain Poa epilis, Potentilla piruersifolia, Sibbaldia procumbens, Calamacrostis breweri, Juncus mertensianus and Draba grassifolia.

2. A Sod-Graminoid, moist site type which contains three sub-divisions.

   a. Sitanion hystrix-Phlox covillei vegetation

Sitanion hystrix	Selaginella watsonii
Phlox covillei	Erigeron compositus
Castilleja nana	Draba breweri
Erigeron pygmaeus	Carex phaeocephala
Arabis lyallii var. nubigena	Silene sargentii
A. lemmoni var. depauperata	Penstemon davidsonii
Eriogonum ovalifolium var. nivale	Poa nervosa

   b. Trifolium monanthus-Phleum alpinum community

Trifolium monanthus	Juncus drummondii
Phleum alpinum	Veronica alpina
Mimulus tilingii	Stellaria umbellata
Gentiana tenella	Mimulus moschatus
Carex spectabilis	Epilobium pringleanum
Saxifraga nidifica	

C. Arenaria kingii-Senecio werneriaefolius community.

Arenaria kingii	Ivesia lycopodioiodes ssp. typica
Senecio werneriaefolius	Lupinus lyallii
Antennaria rosea	Epilobium minutum
A. corymbosa	

3. A Sitanion hystrix-Phlox covillei open, bunch grass-cushion plant dry type which contain three sub-classifications with the following associations.

   a. Carex breweri - Calyptridium umbellatum

   b. Juncus balticus

   c. Arenaria kingii - Senecio werneriaefolius

   For additional information please consult publications listed in the references.

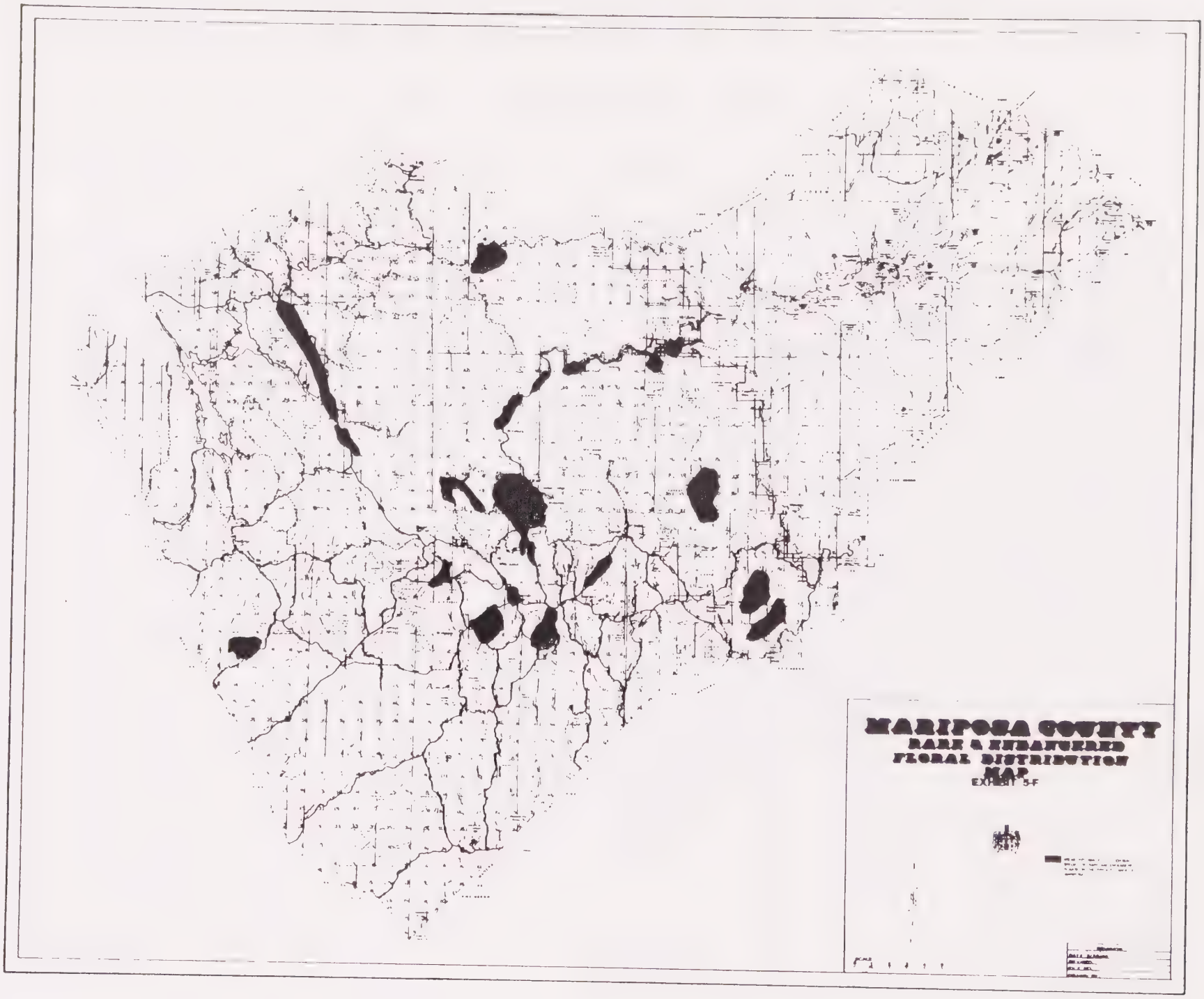
5.403 RARE AND ENDANGERED PLANTS

During the spring and early summer of 1981 a review of literature from the library of the California Native Plant Society[11] and field surveys of known sites was undertaken by the Mariposa County Planning Office and A. Smith. The purpose of this study was to compile in county records all information on location and identification characteristics of all plants located on the privately held lands of Mariposa County. This study in addition produced a map,* Exhibit 5-E , that identifies approximate areas that contain rare and endangered plants and that exhibit characteristics similar to what was found in proximity to the plant sites.

The following is a list of plants considered rare and endangered that occur on private land in Mariposa County.

1.	Allium yosemitense	Mariposa Onion
2.	Calycadenia hooverii	Hoover's Calycadenia
3.	Calyptridium pulchellum	Mariposa Pussypaws
4.	Carax whitneyi	Whitney's Sedge
5.	Clarkia biloba	Mariposa Clarkia
6.	Clarkia lingulata	Merced Clarkia
7.	Clarkia rostrata	Beaked Clarkia
8.	Cypripedium fasciculatum	Clustered Lady's Slipper
9.	Erophyllum congdonii	Congdon's Erophyllum
10.	Juglans hindsii	Northern California Black Walnut
11.	Lewisia congdonii	Congdon's Lewisia
12.	Lupinus deflexus	Mariposa Lupine
13.	Lupinus spectabilis	Shaggy Hair Lupine
14.	Perideridia bacigalupii	Bacigalupi's Perideridia

*This map should not be considered complete and as new sightings occur, records must be kept to enable an annual update.


MARIPOSA COUNTY
RARE & ENDANGERED
FLORAL DISTRIBUTION
MAP
EXHIBIT 5-F

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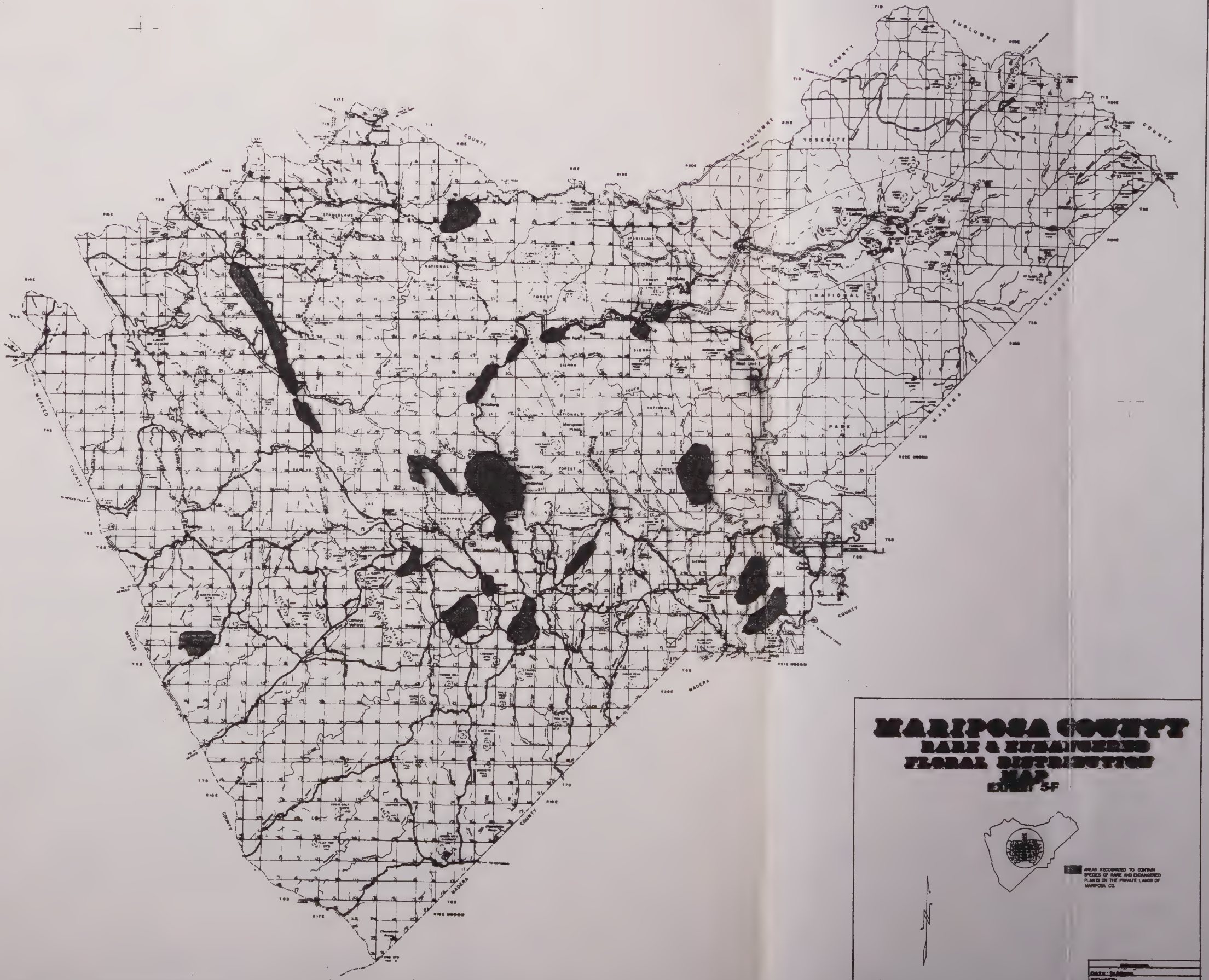

TUOLUMBE COUNTY
MERCED COUNTY
MADERA COUNTY
YOSEMITE
NATIONAL
PARK
FOREST
STANISLAUS
SIERRA
MARIPOSA COUNTY
RARE & ENDANGERED
FLORAL DISTRIBUTION
MAP
EXHIBIT 5-F
AREAS RECOGNIZED TO CONTAIN SPECIES OF RARE AND ENDANGERED PLANTS ON THE PRIVATE LANDS OF MARIPOSA CO.
SCALE
DATE:
REVISION:
DWG. NO.
DRAWN BY:

164CW

5.500 WILDLIFE

5.501 INTRODUCTION

The relationship between plant and animal communities has been utilized in this section to create a framework of regional analysis that will provide information and references for future, more specific site studies and environmental review.

A specific territorial delineation has been made through research by select California State Agencies on occurance of habitat and range of fauna found in the Sierra Nevada. In this section amphibians, reptiles and mammals occuring in Mariposa County have been grouped by floral communities using two factors:

1. The community is identified as prime habitat,* i.e. successional stage.

2. It is the community lowest in elevation that contains an identified occurance of a stable or migratory population of the species.

Additionally notes of occurance found in this text supply brief environmental requirements which aid in identifying specific areas of optimum habitat. The following groups of animals will be incorporated by reference, terresterial and aquatic insects, arachnids, mollusks and other invertebrates. Birds will be briefly listed by floral habitat and fish, due to unique environmental considerations will be listed, and a brief setting description offered. Rare and endangered animals can be found in Section 5.507 and referenced in the text.

This section is to be utilized in conjunction with the floral community description given in the Botany Section, 5.400.

5.502 BACKGROUND AND SETTING

In a discussion of Sierran wildlife, the relationship between plant and animal communities must be viewed in perspective of changes that occured following the discovery of California by western man. Prior to 1769 A.D. only fires ignited by Indians to improve rangeland, for hunting or by accident were modifers of the natural environment. During the Mission Period the introduction of Mediterranean plant and animal species began the slow decline of native life forms. A vivid example of species introduction is the modification of grassland communities that resulted from this invasion. According to Burcham.[3]

> "Within the grasslands which remain, the most striking change undoubtedly has been replacement of the native perennial grasses by annual plants, a large proportion of them introduced from the Mediterranean region of the Old World. Few places on earth--if any--have had such a rapid, large scale replacement of native herbaceous vegetation by alien plants within so short a time."

*It is recognized that game species can be classified by the successional stage in which most occurances are noted and through manipulation of floral successional stages, animal populations can be altered.[16] In addition qualitative methods of habitat analysis are available.[1]

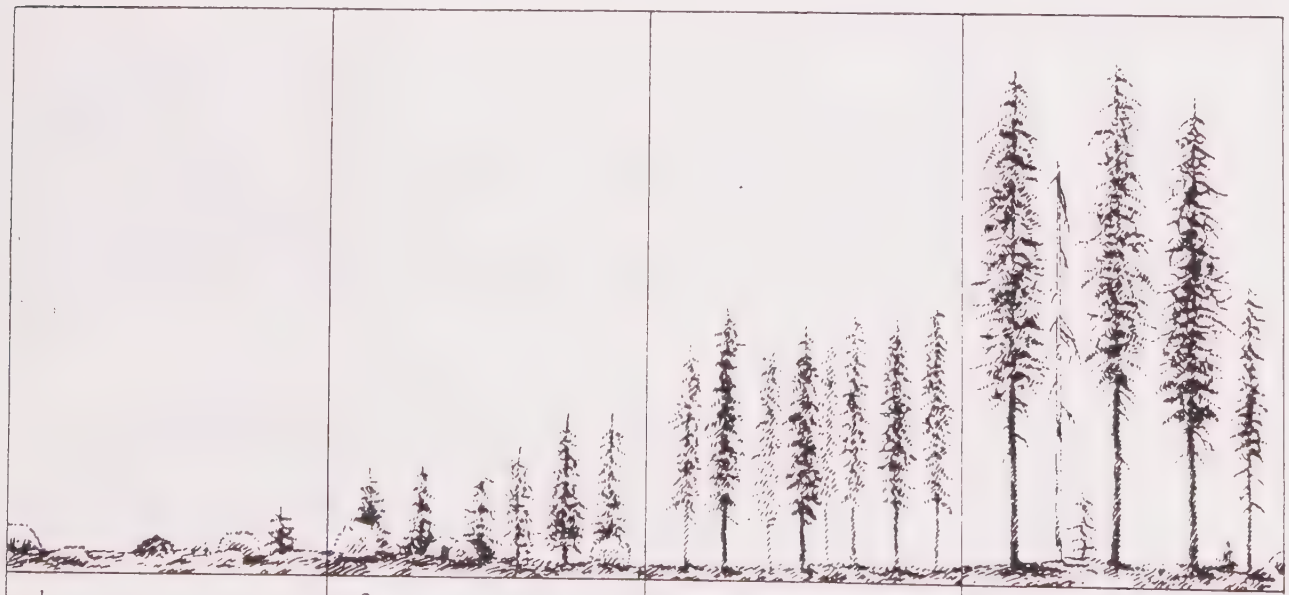
Stress conditions as well as adaption characteristics played an equally important part in the alteration of vegetation. These conditions included drought, overgrazing, predator control, conversion of vast acreages of Central Valley marshlands to irrigated crops, fire suppression, siltation and urbanization are a few modifications that encouraged massive alterations of wildlife populations and extinctions. Dashmann, 1965 states "Between 1850 and 1910 there was a massive change in species numbers and diversity rivaling the post-glacial (Pleistocene) extinctions." Now, in the closing of the 20th century the past effects of development throughout the state have created an environment quite different to the one present 300 years ago. It must be recognized that the descriptions and settings to follow refer to the environment modified by man.

5.503 TERRESTRIAL WILDLIFE

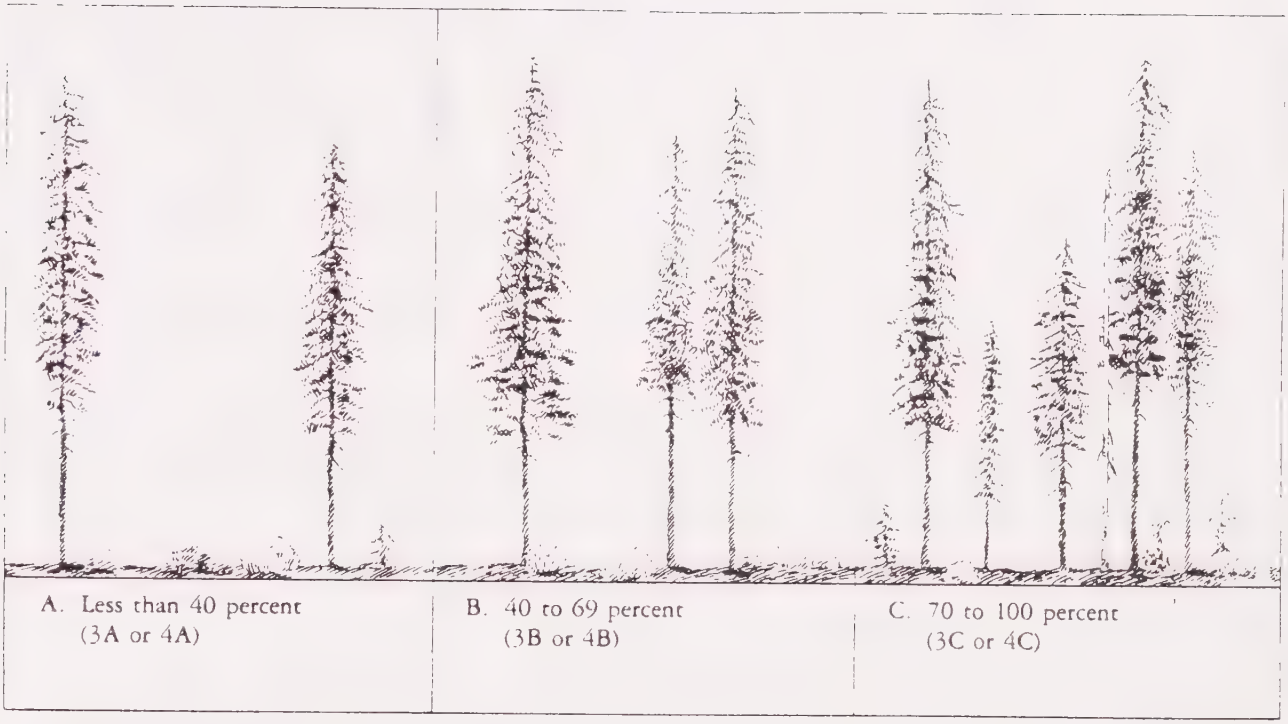
Mariposa County's fauna presently includes 81 species of mammals of which 17 are bats or other flying mammals and one a hoofed animal. There are eight salamanders, one turtle, eight species of frogs and toads, 15 species of snakes and eight lizards inhabiting this region of the Sierra Nevada. Over 193 Avian species are recognized inhabitants of this area either as a resident population or as a result of territory utilization during the annual migration. Crustacea include seven representative species, Mollusks include 50 species of snails, two of clams and one slug, additionally 24 insect orders have been identified as inhabiting the Sierran Region.

A Sierran Vegetative Transect is offered in Exhibit 5-B, and can be utilized when reviewing the wildlife groupings.

The following diagrams illustrate the successional stages and canopy closures and is to be used in conjunction with the notes given in the terrestrial habitat/floral community descriptions that follow:



—Successional stages for forest types in the Sierra Nevada of California.



—Canopy closure classes for successional stages 3 and 4 in the Sierra Nevada of California.

AMPHIBIANS, REPTILES AND MAMMALS GROUPED BY FLORAL COMMUNITIES

A. Valley Grasslands, Associated Riparian Environment and Vernal Pools

Common Name	Scientific Name	Notes
Tiger Salamander	Ambystoma tigrinum	Found below 1000 feet ele. Breeds Dec. to Feb. in ponds, streams, etc.,-Considered a fragile species due to habitat loss.
Western Spadefoot	Scaphiopus hammondii	Found below 1000 ft. ele. Breeds Feb. to Apr. in vernal pools.
Pacific Treefrog	Hyla regilla	Grasslands to 13,000 ft. ele., pools and ponds required for breeding between Feb. and July.
Bullfrog	Rana catesbeiana	Introduced game species, riparian habitat to 6000 ft., known to be having an adverse effect on native frog populations.

Common Name	Scientific Name	Notes
Western Pond Turtle	Clemmys marmorata	Only turtle in Central Sierras, found to 6000 ft. ele. Breeds March to May primarily found in ponds and streams
Western Fence Lizard	Sceloporus occidentalis	Breeds in rock outcrops and friable soil, found to 9000 ft.
Side-Blotched Lizard	Uta stansburiana	Breeds in friable soil, found to 2,000 ft. ele.
Coast Horned Lizard	Phrynosoma coronatum	Considered a fragile species, notes of sitings above 1000 ft should be recorded. Breeds in friable soil
Western Whiptail	Cnemidophorus tigris	Eggs laid in aerated soil May to June. Found to 7500 ft. ele.
Ringneck Snake	Diadophus punctatus	North facing slopes to 6000 ft.ele.
Racer	Coluber constrictor	Found to 6000 ft. ele.
Coachwhip	Masticophis flagellum	To approx. 1000 ft. ele. Mates Apr-May.
Common Kingsnake	Lampropeltis getulus	To 6000 ft. ele. in all successional stages. Mates March-May.
Long-Nosed Snake	Rhinocheilus lecontei	May be fragile. Seldom seen above 1000 ft. ele.
Common Garter Snake	Thamnophis sirtalis	Ponds and streams to 6000 ft. ele.
Western Rattlesnake	Crotalus viridis	To 11,000 ft. ele. in rock outcrops Actively mates March to May.
Broad-Footed Mole	Scapanus latimanus	Widespread and favors moist friable soils. Tunnel openings closed with plug of dirt.
Yuma Myotis	Myotis yumanensis	Requires permanent water for foraging. Distributed throughout County
California Myotis	Myotis californicus	Widespread below 5000 ft. ele. Flight slow and erratic, nocturnal.
Small-Footed Myotis	Myotis leibii	Widespread on arid uplands and hibernates in winter.

Common Name	Scientific Name	Notes
Western Pipistrelle	Pipistrellus hesperus	Common in arid habitats in close proximity to water.
Big Brown Bat	Eptesicus fuscus	Widespread throughout county, flies straight and steady between 13 to 66 feet above land surface.
Spotted Bat	Enderma maculatum	Found up to Yellow Pine Forest, occasionally enters buildings, likes large placid water bodies for drinking.
Townsend's Big-Earred Bat	Plecotus townsendii	Widespread in County. Nests occasionally in buildings.
Palid Bat	Antrozous pallidus	Common in arid low elevations. Semi-dark nesting sites and perches when eating prey.
Brazilian Free-Tailed Bat	Tadarida Brasiliensis	Only bat with exposed tail.
Desert Cottontail	Sylvilagus audubonii	Widespread game species, avoids dense stands. Found in open habitats through successional digger-pine stages.
Black-Tailed Jack-rabbit	Lepus californicus	Found to Conifer Forest in open grassy areas and is an important food source for coyotes and some raptors.
California Ground Squirrel	Spermophilus beecheyi	Common throughout County. Prefers open disturbed areas containing rock outcrops and friable soil.
Botta's Pocket Gopher	Thomomys bottae	Widespread in grassland and forbs in friable soil.
Western Harvest Mouse	Reithrodontomys megalotis	Nocturnal, utilizes woodpecker holes and stands of weeds and grass for nests.
Deer Mouse	Peromyscus maniculatus	Most numerous native mammal in North America and an integral part of the food chain, nocturnal.
Califoria Vole "Meadow Mice"	Microtus californicus	Widespread to approx. 4000 ft. ele. in grassy areas.

Common Name	Scientific Name	Notes
Muskrat	Ondatra zibethicus	Introduced furbearer, abundant in or near aquatic environments. Around cattails and tules, active all year.
Coyote	Canis latrans	Widespread, prefers grass-forb and shrub -sapling stages of all communities.
Raccoon	Procyon lotor	Rare to common in all low to middle elevations riparian areas. A license required to take this furbearer.
Long Tailed Weasel	Mustela frenata	A widespread furbearer that prefers meadows and sapling stages of timber
Badger	Taxidea taxus	An uncommon, widely distributed protected furbearer that inhabits primarily sub-surface grass-forbs of all habitats.
Western Spotted Skunk	Spilogale gracilis	A common, infrequently seen primarily nocturnal animal that can be found to Yellow Pine Forest and inhabits rock outcrops, hollow logs and brush piles.
Striped Skunk	Mephitis mephitis	Similar to the Western Spotted Skunk but with wider range.

B. Valley/Interior Live/Blue Oak - Digger Pine

California Newt	Taricha torosa	Found below 6000 ft. ele. in primarily riparian deciduous communities, pools, some lakes and streams Active between early winter to early summer.
Limestone Salamander	Hydromantes brunus	(Rare and endangered, for description see Section 5.507(A).
California Slender Salamander	Batrachoseps attenuatus	Found to 5000 ft. ele. and only slender salamander found north of Merced River. Found under logs, surface litter and rocks in moist soil.

Common Name	Scientific Name	Notes
Arboreal Salamander	Aneides lugubris	Found to 5000 ft. ele. usually found in association with interior live oak under logs and litter when moist. Uses burrows during summer-primarily a foothill species.
Western Toad	Bufo boreas	To 10,000 ft. ele. uses riparian environment for breeding, utilizes shallow burrows and eggs are laid in open water from Feb. until Jul. This is the common toad of Calif.
Red legged Frog	Rana aurora	(Rare and endangered species, for description see Section 5.507(B).
Foothill Yellow-legged Frog	Rana boylei	Found to 6000 ft. ele. in permanent streams and has been effected by reduced stream flow.
Gilbert's Skink	Eumeces gilberti	Found to 6500 ft. ele. Eggs laid in loose aerated soil in Jun-Jul.
Southern Alligator Lizard	Gerrhonotus multicarinatus	Found to 6000 ft. ele. in riparian deciduous communities throughout the County.
Sharp-tailed Snake	Contia tenuis	Found to 7000 ft. ele. in deciduous and mountain meadow communities-Not found in blue oak or annual grasslands.
Striped Racer	Masticophis lateralis	Found to 5500 ft. ele. in primarily chaparral on riparian deciduous environments.
Gopher Snake	Pituophis melanoleucus	Found in all environments up to 7000 ft. ele.
California Mountain Kingsnake	Lampropeltis zonata	Found to 6500 ft. ele. in proximity to streams. A target for pet collectors.
Western Terrestrial Garter Snake	Thamnophis elegans	Found to 12,000 ft. ele. in permanent streams and lakes
Western Aquatic Garter Snake	Thamnophis couchi	Found to 6000 ft. ele. around stream channels.
Opossum	Didelphis virginiana	Introduced to Calfi nia in 1910, inhabits rock piles, trees, snags and culverts, follows water courses.

Common Name	Scientific Name	Notes
Ornate Shrew	Sorex ornatus	Requires moist soil, stumps, logs and litter. Active throughout day and night.
Little Brown Myotis	Myotis lucifugus	Found from upper oak woodland to crest of Sierras and colonies are located close to water.
Fringed Myotis	Myotis thysanodes	Most known localities in oak woodland.
Long-legged Myotis	Myotis volans	Widespread in oak woodlands and mixed conifer forest.
Silver-haired Bat	Lasionycteris noctivagans	Widespread on western slope of Sierras. A slow flier.
Red Bat	Lasiurus borealis	Prefers moderately dense stands of trees for roosting
Merriam's Chipmunk	Eutamias merriami	Found in all plant communities that have a thick shrub understory.
Western Gray Squirrel	Sciurus griseus	A game species found through Jeffery pine forest. Prefers mature stages of all communities.
California Pocket Mouse	Perognathus californicus	Widespread in oak woodlands and chararral, requires friable soil and brushy areas.
Heermann's Kangaroo Rat	Dipopomys heermanni	Same as Calif. Pocket Mouse except prefers bare areas and populations are inhanced by fire.
California Mouse	Peromyscus californicus	Favors brushy communities and California Bay trees.
Brush Mouse	Pedomyscus boylii	Serves as improtant biological control of some insect pests of forest trees. Prefers shrub-sapling understory with little brush.
Pinon Mouse	Peromyscus truei	Widespread and common below Yellow Pine belt.
Dusky-Footed Woodrat	Neotoma fuscipes	Found up through mixed conifer forests, avoids cultivated land, open grasslands and pure chaparral stands. Stick pile nests can be up to 6 ft. high. Kissing bugs breed in this environment.

Common Name	Scientific Name	Notes
Porcupine	Erethizon dorsatum	Found through Lodgepole Forest, avoids chamise chaparral and oak savanna areas.
Gray Fox	Urocyon cinereoargenteus	Avoids dense stands and mature forest. Prefers chaparral and seedling/sapling stages of this plant community. Dens found in rocky areas and hollow logs, can climb trees.
Black Bear	Ursus americanus	Found to Alpine Meadows, can be aroused from hibernation if disturbed. Uprooted or hollow trees are preferred denning areas.
Ringtail	Bassariscus astutus	A fully protected furbearer and in this habitat, less than 40% canopy cover is optimum. Inhabits rock piles, burrows, woodrat nests, hollow trees and snags.
Mink	Mustela vison	Widespread but dependent on riparian habitat as a source of water, diet and possible burrow sites.
Mountain Lion	Felis concolor	Found in association with deer in all habitats. Can bury food, cubs born in March or April.
Bobcat	Felis rufus	Prefers chaparral and seedling/sapling successional stages of woodlands and forests. Dens in rocky areas and dense brush. Population estimated at 2.0+ animals per section in prime habitat.

C. Chaparral

Common Name	Scientific Name	Notes
Ensatina	Ensatina xanthoptica	Found primarily in upper foothill region, produces an astringent secretion when disturbed, arches and sweeps it's tail.
Night Snake	Hypsiglena torquata	Found to 6000 ft. ele. requires rock outcrops, found in mines, breeds Apr. to July, preys on slender salamanders and lizards.
Long-eared Chipmunk	Eutamias quadrimaculatus	Found through mixed conifer forest in brushy areas of dense canopy cover, hibernates Nov. to March.

D. Yellow Pine Forest

Common Name	Scientific Name	Notes
Relictual Slender Salamander	Batpachoseps relictus	Found to 8000 ft. ele. in mountain meadows, black oak woodland and riparian inhabitats. Requires moist soil.
Enstatina	E. eschscholitzi	A forest dweller found from Chaparral to mixed conifer forest, active from April through Sept. same defense reaction as E. xanthoptica
Mountain Yellow-Legged Frog	Rana muscosa	Riparian habitats to alpine meadows, requires permanent water and population was reduced by trout introduced to high elev. lakes.
Sagebrush Lizard	Sceloporus graciosus	From 6000 to 9000 ft. ele. in friable soil and rock outcrops is successional stages of pine/oak habitat.
Northern Alligator Lizard	Gerrhonotos coeruleus	Found to 11,000 ft. ele. in mature stands
Rubber Boa	Charina bottae	Found to 9000 ft, ele. near streams and meadows in mature or climas communities.

Common Name	Scientific Name	Notes
Vagrant Shrew	Sorex vagrans	Found to alpine elevations in riparian areas. Solitary and secretive.
Water Shrew	Sorex palustris	Found to Alpine elevations, requires small cold stream and wet areas, effected by turbidity in streams and active all year.
Trowbridges' Shrew	Sorex trowbridgii	Common in climax pine and mixed conifer forests in both wet and dry areas.
Long-eared Myotis	Myotis evotis	Uncommon but ranges from mid to high elevation in Sierras. Colonies ranges from 12 to 30 females and require water.
Mountain Beaver	Aplodontia rufa	Prefers thick reparian habitat to alpine elevations. Nests to 5+ feet underground, climbs trees, not aquatic and prefers forbs and shrubs.
Yellow Pine Chipmunk	Eutamias amoenus	Found to lodgepole pine community in open forest, requires shrubs, stumps and slash piles and caches food underground.
Allen's Chipmunk	Eutamias senex	Wide spread in all coniferous forests with dense shrub understory. Little recorded biology on this species.
Lodgepole Chipmunk	Eutamias speciosus	Found wide spread through lodgepole pine forest, hibernates from Nov. to March, expert tree climbers and aids in reforestation by burying seeds.
Golden-mantled Ground Squirrel	Spermophilus lateralis	Widespread to alpine fell fields, hibernates from Oct. to Apr. and prefers open forest with limited understory.
Douglas' Squirrel	Tamiasliurus douglasii	Game species wide spread through lodgepole pine in mature areas of dense canopy cover with little understory, active all year.

Common Name	Scientific Name	Notes
Northern Flying Squirrel	Glaucomys sabrinus	May not be killed or captured, widespread through lodgepole pine forest, prefers mature stands, glides up to 150 ft. Owls are main predators, does not store food
Mountain Pocket Gopher	Thomomys monticola	Widespread to Sierran crest. Active all year, requires friable soil and forest openings for burrowing. Tunnels in snow during winter.
Montane Vole	Microtus montanus	Ranges to 12,500 ft. ele. in meadows and moist areas. Builds grass nests in snow and does not hibernate.

E. Red Fir/Lodgepole Forest

Common Name	Scientific Name	Notes
Mount Lyell Salamander	Hydromantes platycephalus	Discovered in traps in 1915, thought to be a relic of Pliestocene Glaciation, species endemic to Sierra Nevada, ranges to 11,600 ft. ele. Found at base granite talus slopes in wet areas, a relative of the Limestone Salamander.
Yosemite Toad	Bufo canorus	A fragile species, found to 11,300 ft. ele. Requires warm ponds in meadows for breeding.
Mt. Lyell Shrew	Sorex lyelli	Listed by some sources as rare, this mammal is limited to proximity of Mt. Lyell. Very limited information on this specie.
Dusky Shrew	Sorex monticolus	Found to high elevations in proximity to riparian habitats and requires moist soil.
Snowshoe Hare	Lepus americanus	A game species found to alpine fell fields, prefers successional and riparian communities

Common Name	Scientific Name	Notes
White-tailed Jackrabbit	Lepus townsendii	Found through alpine fell fields, prefers early grass-forb stages and meadows and migrates to lower elevations during winter.
Alpine Chipmunk	Eutamias alpinus	Found through alpine fell fields, prefers talus slopes, stunted pines and downed logs. Hibernates in winter.
Yellow-bellied Marmot	Marmota flaviventris	Found in meadows and talus slopes, hibernates Oct. to May and nests amid tree roots and rocks.
Beldings Ground Squirrel	Spermophilis beldingi	Common throughout high mountain habitats, prefers meadows and successional stages of forest communities near meadows and hibernates Sept. to Apr.
Bushy-tailed Woodrat	Neotoma cinerea	Widespread in rocky, early successional forest stages, nocturnal and common.
Long-tailed Vole	Microtus longicaudus	Common throughout Sierras, a ground forager not restrained to runways. Prefers sedges, grasses and forbs and does not hibernate.
Western Jumping Mouse	Zapus princeps	Common through all successional stages around riparian communities and other wet areas. Hibernates from about Sept. to May.
Red Fox	Vulpes vulpes	Found through alpine fell fields, during winter migrates through yellow pine forest. This protected furbearer requires rock piles, stumps or loose soil for den sites and is actjve day and night. See Section 5.507(G)
Marten	Martes americana	Prefers mature 40% canopy cover forest areas, talus slopes and snags. Forages in trees and on ground and is active all year.
Fisher	Martes pennanti	A rare and endangered species. see Section 5.507(F).

Common Name	Scientific Name	Notes
Ermine	Mustela erminea	Prefers open forage areas and dense climas timber for breeding. A trapping license is required to take this furbearer.
Wolverine	Gulo gulo	Listed as rare and fully protected this animal prefers timberline habitats and moderate to dense canopy cover and forages above ground as well as excavates below for food

F. Alpine Fell Field

Common Name	Scientific Name	Notes
Pika or Cony	Ochotona princeps	Confined to talus slopes and adjacent meadows in high mountains, preyed on by weasels and martens. Collects grass and dries food in deep rock crevices.
Heather Vole	Phenacomys intermedius	Found to 9800 ft. ele. amid heathers and huckleberries. Eats bark, berries, seeds, etc. Nests under snow in grass lined nests.
River Otter	Lutra canadensis	Although this animal prefers foothill riparian regions, alpine occurances during times of running water have been noted in Mariposa County. This protected animal prefers an aquatic diet consisting of fish, amphibians, crayfish and mammals.

5.504 THE AQUATIC ENVIRONMENT

The Aquatic/Riparian Environment of Mariposa County is recognized by the California Department of Fish and Game to include 1,538 acres of established riparian habitat. This environment contains rivers, streams, intermittent creeks, ponds, bank riparian vegetation and large springs and meadows. Representing .164% of the total acreage for the County, listed at 934,690 acres this minute percentage represents the most fragile community present in the County, the one most susceptible to destruction and which the vast majority of wildlife is dependent upon. Based on this substantiated observable evidence, this habitat must receive the most consideration and study when development or modifications are proposed.

This section to be used in conjunction with the terresterial wildlife and riparian section in Flora, Section 5.400, will list the fish that inhabit the warm and cold water environment in Mariposa County.

Introduced		Native	
White Catfish-1874	Brown Bullhead	Pacific Lamprey	California Roach
Mosquito Fish	Green Sunfish	Mountain Whitefish	Sculpins
Small Mouthed Bass	Large Mouthed Bass	Chinook Salmon	Sacramento Squawfish
Bluegill	Tuichub	Western Sucker	Cut-throat trout
Lake Trout-1895	Eastern Brook Trout	Speckledace	Golden Trout
European Brown Trout - 1895		Hard head	Rainbow Trout
Pumpkinseed	Red-earred Sunfish	Three-spined sickleback	Hitch

Fish feed on a variety of insects, larvae, eggs of aquatic organisms and other animals, general feeding information can be found by consulting reference No. 4.

Aquatic habitats include cold running water riffles, margins of stream banks, bear folage, gravel beds, sand bars and deep pools. This environment is primarily threatened by accelerated erosion which clogs stream beds with silt, change water quality and modifies aquatic vegetation, all which disrupt the food chain.

In addition to streams, ponds offer a unique setting for aquatic wildlife. Ponds usually develop due to natural or unnatural containment of drainage channels, respond to seasonal fluctuations in water level and act as a feeding and resting area for terresterial wildlife. Many times ponds develop aquatic habitats through artifical means or by cross-country migration of amphibians. These basins also serve as temporary sediment traps

5.505 AVIAN SPECIES

Due to the unique characteristics, diversity and dispersion of the avian species, only a brief overview will be offered, in addition if more information is desired, references are provided that will amplify this section. It must be noted that woodlot management practices, i.e., fencing to prevent grazing, can establish areas that act as a refuge for birds as well as other wildlife.[17]

BIRDS ASSOCIATED WITH APPLICABLE HABITATS OF MARIPOSA COUNTY

Streamside Plants

Rufous Hummingbird
Calliope Hummingbird
Yellow-bellied Sapsucker
Downy Woodpecker
Western Flycatcher
Traill Flycatcher
Swainson Thrush
Warbling Vireo
Yellow Warbler
Tolmie Warbler
Yellowthroat
Yellow-breasted Chat
Pileolated Warbler
Red-winged Blackbird
Bullock Oriole
Brown-headed Cowbird
Black-headed Grosbeak
Lazuli Bunting
Goldfinch
Rufous-sided Towhee
White-crowned Sparrow
Song Sparrow

Brush or Chaparral

California Quail
Mountain Quail
Roadrunner
Poorwill
Ash-throated Flycatcher
Wrentit
Bewick Wren
California Thrasher
Orange-crowned Warbler
Tolmie Warbler
Green-tailed Towhee
Rufous-sided Towhee
Rufous-crowned Sparrow
Bell Sparrow
White-crowned Sparrow
Golden-crowned Sparrow
Fox Sparrow

Forest or Woods

Goshawk
Sharp-shinned Hawk
Cooper Hawk
Dusky Grouse
Band-tailed Pigeon
Red-shafted Flicker
Pileated Woodpecker
Yellow-bellied Sapsucker
Williamson Sapsucker
Hairy Woodpecker
White-headed Woodpecker
Three-toed Woodpecker
Small Flycatcher
Olive-sided Flycatcher
Wood Pewee
Steller Jay
Clark Nutcracker
Mountain Chickadee
White-breasted Nuthatch
Red-breasted Nuthatch
Pygmy Nuthatch
Brown Creeper
Winter Wren
American Robin
Hermit Thrush
Townsend Solitaire
Golden-crowned kinglet
Ruby-crowned Kinglet
Solitary Vireo
Audubon Warbler
Black-throated Gray Warbler
Hermit Warbler
Western Tanager
Black-headed Grosbeak
Evening Grosbeak
Purple Finch
Cassin Finch
Pine Grosbeak
Pine Siskin
Red Crossbill
Junco
Chipping Sparrow

[15]

Note: Please refer to Sec. 5.507 for discussion of Avian Rare and Endangered Species.

and in order to be maintained, dredging and limiting of stream erosion must be accomplished. Shoreline vegetation, a habitat enhancement, can only be established when water fluctuation is controlled usually by artificial recharge or, in limited occasions, when year around natural flow is established.

Deep water aquatic environments, primarily man made inpoundments and flood water retention facilities, provide additional habitat for wild fowl during migration and creates an environment that favors rough fish. Although these basins are stocked with introduced game species, the following excerpt discusses some fish management problems.

"....reservoirs in the basin," referring to the San Joaquin River Basin of which Lake McClure is a part. ed.,"cannot be properly managed for sport fishing because of the large water-level fluctuations during the spring spawning season. When spawning is delayed, the young game fish face heavy competition from young-of-the-year forage fish. If water levels rise after spawning occurs, nests are cooled and the adult spawners abandon them.

Fall drawdowns concentrate fish and result in higher young-of-the-year predation losses. Most reservoirs in the basin also lack shoreline vegetation below and above the water surface, limiting cover and food supplies.

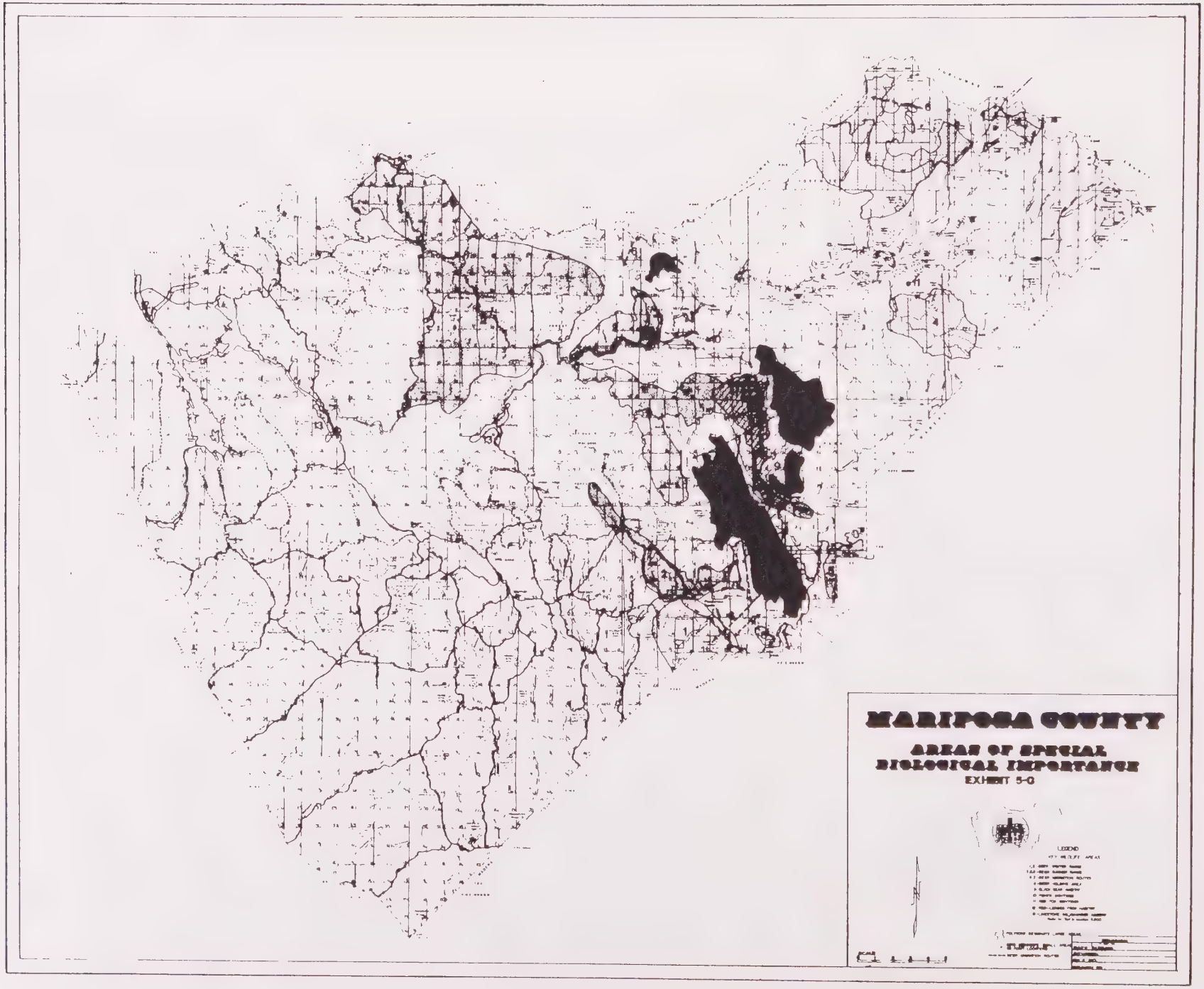
Studies by DFG indicate that good angling can be maintained in a reservoir if largemouth bass are allowed to successfully spawn every 4 years. Successful spawning occurs if water levels are stabilized for 6 to 8 weeks after water temperatures reach 60° F. If fluctuations are necessary during the typical mid-April to mid-May spawning period, they should not exceed a 2-foot decrease or 5-foot increase during any 20-day period. This regime would still allow a majority of nests to be successful.

If an operations program could be devised which allows a successful spawning once every 4 years in all reservoirs of a region, good angling could be maintained throughout the region."

Other recorded problems of man-made water retention facilities include:

1. Creation of barriers for migratory fish.
2. Damage or destruction of fish in outlets and canals.
3. Water level fluctuations do not allow establishment of riparian vegetation along shoreline, this vegetation serves as habitat for insects for food and produces roots and branches that serve as shelter.

4. Concentration of sediment.
5. Need to apply chemical treatment to remove undesirable fish species.


MARIPOSA COUNTY
AREAS OF SPECIAL
BIOLOGICAL IMPORTANCE
EXHIBIT 5-G

5.506 ARACHNIDA AND INSECTS

The most common members and an integral part of the food chain, the insect supplies bio-mass for higher order animals, pollenates plants and assists in the decomposition of plant and animal tissue. In addition insects are known for their negative effects as vectors for bacterial and viral infections, distruction of stands of timber and wooden structures and infestations at times harm grain crops, produce, orchards and affect livestock. Due to magnitude of numbers and lack of research time, even a partial listing is viewed by the author to be inpractical and instead would like to refer readers to a basic text for additional general information.[19] An in depth survey of benthic invertebrates was performed on a section of the Merced River from Briceburg to a point 25 miles upstream.[23]

5.507 RARE AND ENDANGERED FAUNA

A map showing areas of biologic importance, Exhibit 5-E, relates territorial extent of critical fauna.[5]

A. Limestone Salamander
B. Red-legged Frog
C. Peregrine Falcon
D. Spotted Owl
E. Fisher
F. Red Fox

A. Limestone Salamander Hydromantes brunus; A unique old and new world occupant

In order to gain knowledge and perspective on this unique amphibian, clarification must be made regarding an assumption surrounding the habitat of H. brunus. Over 90% of the known habitat is in rock formations other than limestone and the species is not endemic to this or any other rock type. It should be noted that a major site is located five miles from the nearest limestone. This point has been belabored because concerned citizens have made the statement that because there is no limestone, there must be no salamanders. This conclusion could lead to an adverse effect on the salamander's habitat.

A review of literature has established that, although relatively little is known about the ecology and life history of H. brunus, several valid generalizations can be made.

This salamander inhabits the talus cones up slope of the high water mark on the Merced River and tributaries extending from Briceburg to Hell Hollow, below Bagby.

Curiously, the majority of all sightings have been in proximity to a Calfiornia Buckeye Tree, Aesculus californica in the following floral units; Hard Chaparral, Buckbrush, Chamise and Ceanothus, Oak/Digger Pine woodland, or Yellow Pine Forest.

The talus slope habitat must meet several specific criteria.

1. Have a north to eastern facing slope. This provides minimal solar radiation and lower evaporation rates which result in a lower than normal ambient temperature.

2. The slope itself must be approximately 34% or steeper which indicates a natural rock fall process that results in larger interior cavity areas than can be created by the artificial movement and stacking of unconsolidated sediment.

3. Moss, during the wet season, and a thick vegetation covering.

4. Be located above the high water mark.

The salamander's characteristics are as follows:

1. Above ground activity is limited to night time forays in or following a rain. This occurs primarily from perhaps Nov. to April. Note: For climatic information of this region please refer to Section 5.200 .

2. Subterranean mating occurs from May through June.

3. Mean clutch size is seven and ranges from 5 to 14 individuals.

4. Brown on the dorsal side blending to pale brown to gray below on the body and yellowish on the tail.

5. Lengths to 10 cm.

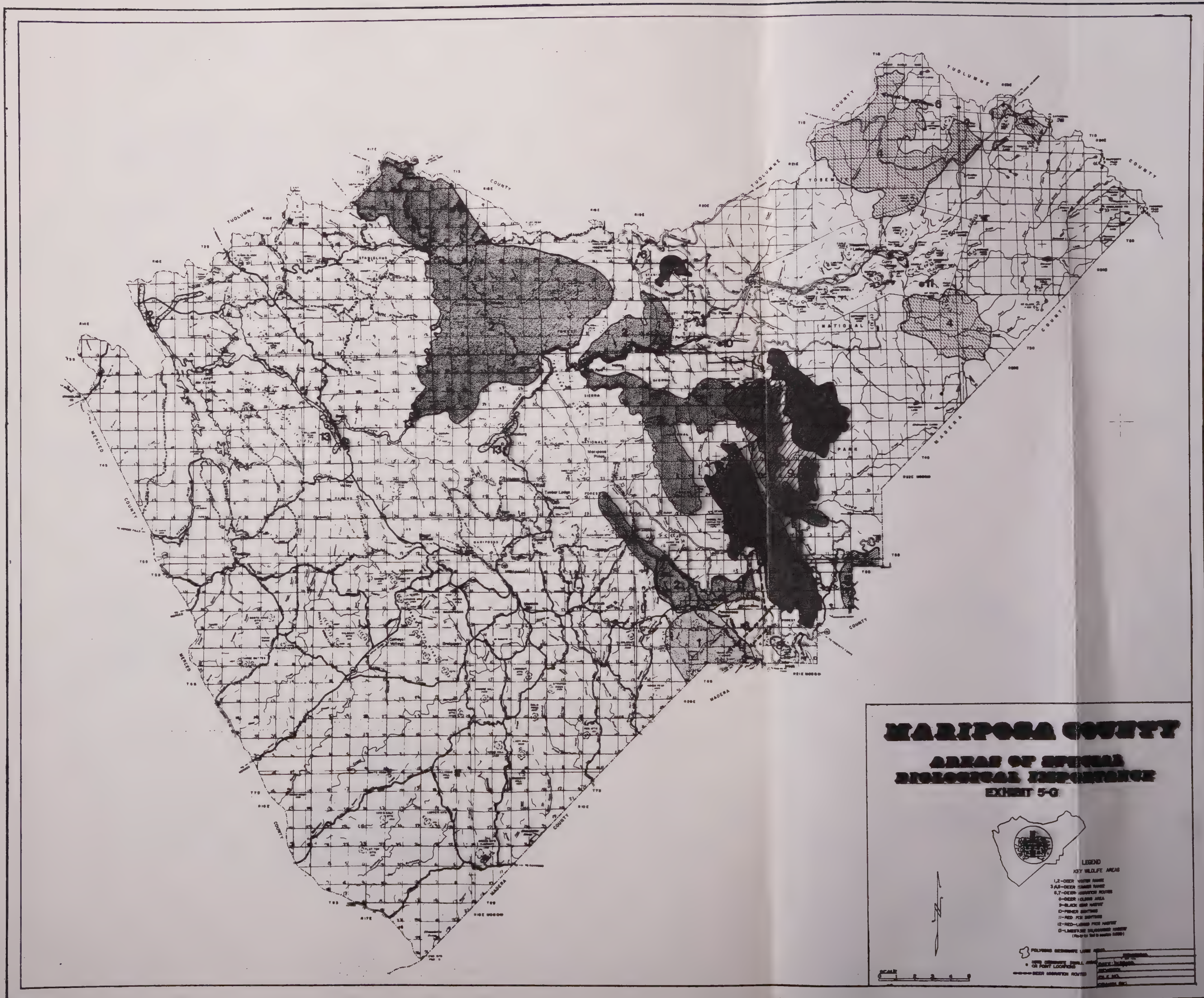
This area has been subject to a variety of environmental stress conditions and these should be noted for future use.

1. Intensive placer and subsurface mining has occured since the 1860s and resulting mill operations created a high sediment discharge. Cyanide was also introduced to the watershed as a result of mill operation.

2. Arsenic springs have been located along Sherlock Creek, a tributary to the Merced River.

3. Annual brush fires were started in this area by the now abandoned Yosemite Valley Railway.

4. With the creation of Lake McClure, the water level of the Merced River south of Bagby experiences un-natural flucuations and the water velocity has diminished resulting in sedimentation of the river channel.


MARIPOSA COUNTY
AREAS OF SPECIAL
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LEGEND
KEY WILDLIFE AREAS
1,2-DEER WINTER RANGE
3,4,5-DEER SUMMER RANGE
6,7-DEER MIGRATION ROUTES
8-DEER HOLDING AREA
9-BLACK BEAR HABITAT
10-FISHER SIGHTINGS
11-RED FOX SIGHTINGS
12-RED-LEGGED FROG HABITAT
13-LIMESTONE SALAMANDER HABITAT
DEER MIGRATION ROUTES
SCALE
TUOLUMNE COUNTY
MADERA COUNTY
MERCED COUNTY
YOSEMITE NATIONAL PARK
MARIPOSA

080CW

B. Red-legged Frog Rana aupora

This amphibian, which is considered fragile, is being depleted due to competition from the introduced bullfrog Rana catesbeiana. Its territory in Mariposa County is limited to isolated occurances in the Piney Creek riparian habitat north of Lake McClure. This country consists of deeply cut canyons and in areas almost inaccessable to the casual observer. The following exerpt, Storer and Usinger, 1963 gives a brief summary of this amphibian.

"H. & B. 2 1/2"-5"; eardrum 2/3 or more size of eye; skin smooth or slighly rough; a low ridge (dorso-lateral fold) on each side of back from eye to end of body; upper surface brownish to olive with fuzzy-margined dark spots pale at center; limbs blotched with blackish; pale streak on upper jaw from below eye to shoulder; under surface pale; hind parts, including legs, reddish in life. DISTR. Western foothills s. to Eldorado Co.; in permanent ponds, lakes, reservoirs, and quiet pools along streams.

This rather uncommon and wary frog is so weak-voiced that it is found only by persons who search for it. Toward the end of winter its eggs, 2000-4000, are deposited in a sticky mass attached to vegetation in water up to 6" deep. Each egg is covered by 3 jelly coats, the outer-most 1/3" in diameter. Most of the larvae transform by mid-summer, the young frogs being slightly over 1" long. The food is largely of insects caught in or near the water."

The Forest Service recognizes a more northern extent, through Shasta Co. and southern confirmed limits are set at Mariposa County. A riparian oak/digger pine association as well as riparian hard chaparral are identified as preferred habitats. In addition the Forest Service recognizes a clutch size of from 100 to 600 which varies from the above description.

C. Peregrine Falcon or Duck Hawk Falco peregrinus

A state and federal listed endangered bird.

Now extinct east of the Rocky Mountains, this migratory bird has decreased in population 90% between 1940 and 1970 due to habitat loss, human activity and pesticides. While not a resident of the Sierra Nevada during the winter, spring finds this falcon foraging from the lower grasslands through the lodgepole pine belt. Preferred food includes band-tailed pigeons, woodpeckers and jays. A black cap and cheek patches are the most distinguishing characteristics of this medium sized blue-gray hawk which is often mistaken for the prairie falcon which has similar foraging and nesting requirements.

D. Spotted Owl Strix occidentalis

A solitary nocturnal creature, the spotted owl inhabits the lower red fir and yellow pine forests. It requires heavily forested areas with large amounts of shade and utilizes a home range of approximately 230 acres. This owl breeds in tree hollows, cliffs and abandoned nests normally 1.9 to 15 m. above ground. It produces one to four (4-5.2 cm.) white eggs which hatch in the spring. This predator's diet includes woodrats, mice, grasshoppers and other small rodents and insects.

The spotted owl is considered a sensitive species although it is fairly common in suitable habitats.

E. Fisher Martes pennanti A sensitive listed furbearer.

This relative of the Marten M. americana, an inhabitant of the Red Fir-Lodgepole Pine forest has an estimated range from Tulare County northward. Fur trapping has been considered the reason for the decline of M. pennanti and now any sightings in the Sierras are uncommon. Diet consists of squirrels, porcupines, beaver, rabbits and other mammals as well as insects and berries. The nose, lower legs and rear portion is black in coloration with the remainder dark brown. Nests in hollow trees and snags.

An infrequently seen
F. Red Fox Vulpes vulpes: High Sierran inhabitant.

From Alpine meadows in the summer to Ponderosa/Yellow Pine forest in the winter, this highly mobile animal does not prefer human activity and as a result only infrequent sightings occurs. The Dept. of Fish and Game recognizes this mammal as a fully protected furbearer and notes that they are highly vulnerable to disturbance, especially to overgrazing of alpine meadows.

Mating between Jan. and Feb. produces litters from four to six in number by May or June in dens located in rocky areas, talus slopes, stumps, logs or underground. Small rodents, birds and berries are preferred food which is foraged for day and night over a territory which ranges from approximately 320 acres to 5110 acres.

5.508 Migratory Deer Herds

The Department of Fish and Game utilize this game animal as a primary inventory specie and have delineated the areas of both winter and summer range and migration routes for the migratory deer population. The following description offers some information on their habits.

"The thousands of people in the Sierra see only a few of the thousands of deer living there, so adept are these animals at hiding in brushy cover. Some deer live yearlong in the foothills and lower forests, but many migrate upslope with advancing spring greenery and a few later go almost to the crest. The return begins with the first storm bringing to 12 inches of snow, commonly by mid-November. Winter concentrations on the west slope are near the lower border of yellow pines where the snow is 18 inches deep or less. Deer forage mostly in morning, late afternoon, and early evening; by day they bed down, often under sheltering bushes where there is a clear view of surroundings. The bed is a slight depression, 2 or 3 feet in diameter, sometimes scraped free of surface litter. The animals dring regularly, often traveling far in autumn when water is scarce. Deer eat a great variety of plants, browsing on shrubs and grazing on grass and herbs in meadows. Many bushes of ceanothus and other shrubs are trimmed of terminal branchlets and leaves. If local deer numbers are large, the bushes may show excessive use and be "pruned" in peculiar shapes by overbrowsing. Antlers begin growth on bucks in April and become mature by late summer, and the dried "velvet" (covering skin" is rubbed off by September. Bucks use their antlers contending with other males during the mating season or rut in early winter; the antlers are dropped by March. Fawns, commonly 2 per birth, appear in June; by early autumn their spots disappear with mold into the winter coat. Does and fawns commonly keep together until the next young are due. Native enemies are the mountain lion, which can kill deer of any age, and the coyote which gets fawns and occasional older deer hampered by snow. Hunters shoot many deer annually under legal control, and an unknown number are removed by poachers. Some deer die of starvation, and some are lost through accidents."[16]

A large population of resident deer occupies Mariposa County but because of human avoidance characteristics and the ability to successfullly go un-noticed by humans, hunters have difficulty seeing deer in areas that have a population density of 100 per square mile.[14]

The effect of urbanization on migratory deer herds in the Sierras has not been extensively researched. The most significant information available comes from the California Department of Fish and Game's study of migratory deer herds in portions of Lassen, Shasta and Modoc counties. The forage and migratory characteristics of the deer in this study are similar to the migratory deer herds of Mariposa County. The following information is a summary of the above study.

Migratory deer of the Sierras spend their summers in the vast mountainous areas usually above 5,000 feet. Most of this land is owned by the U. S Government and should remain suitable for summer range well into the future. Such range represents the least critical habitat area for deer at the present time.

In the fall, the migratory herds often concentrate in a holding area outside the winter range and then disperse thru the migration corridors (often quite narrow) and out into their wintering area. Because these corridors are often narrow, they become critical and should be maintained as natural as possible. Development in these areas can eliminate forage and cover plants as well as obstruct existing trails. Development in these areas often brings disturbances such as noise, traffic and dogs which, if of a sufficient level, are unacceptable to deer at this sensitive period.

When the deer reach their wintering area they feed on a variety of forage. Acorns have been recognized as an important food for wintering deer. They are highly nutritous and allow deer to build up excess body fat in the fall that helps maintain them thru the winter. Studies have correlated increases in fawn production with years of heavy acorn production. Because of their forage value, oaks should be protected and cultivated in deer wintering areas. If early rains make grasses and forbes available, oak woodlands become less important as deer disperse throughout the area to forage on the young plants.

Areas that provide thermal cover for wintering deer are also recognized as important. When severe winter conditions exist, deer leave forage areas and seek heavily wooded areas for protection. Deer are heavily stressed at this time of the year and are quite sensitive to disturbances that may be caused by human habitation. If these wintering areas are heavily developed, the deer winter-kill can increase alarmingly. Studies on the May herd in Shasta County indicate areas where substantial development in key wintering areas has taken place, have a much higher rate of winter-kill, especially affecting the fawns.

In the spring deer feed on the new growth of annual grasses and forbes. Deer congregate on open grassy areas and feed, almost exclusively, on this lush vegetation. Such forage is vitally important because it allows

the herd to recover from the nutritional losses accumulated during the winter. It is also vital for the health of pregnant does and their soon to be born fawns. In Mariposa County much of these valuable areas are held in large ranches which presently provide protection from human density increases.

As summer nears, the herds again congregate and prepare to migrate into their summer range. The herd usually follows the same migration route as it used in the fall. Again, these narrow migratory routes represent a very sensitive habitat area for the deer herds. Because of the concentrations of deer in these areas, even low density development can represent a significant impact.

As development increases in areas frequented by deer, conflicts between residential use and deer forage needs also increase. Deer, especially when stressed, often feed on gardens, ornamentals and fruit trees. Such browse is often found unacceptable to the new residents. Some farmers and ranchers believe that increased development in forage areas causes them increased crop damage.

5.509 REFERENCES

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As a consequence of unique geologic and topographic features infiltration primarily begins in granitic rocks, migrates through metamorphic formations and arrives at the County line in an alluvium.

This migration is tapped at various locales for domestic use. The nature of this system imposes unique limitation. These will be addressed by examining each waterbearing rock unit and illustrating, through select research, the developmental constraints imposed by natural features.

5.602 GRANITIC HYDROLOGY

As recognized in Geology Section 5.100 (See transect, Ex. 5-B), granite is the first rock unit encountered in the downward migration of groundwater. Granitic masses are implaced through a series of intrusions which create structural characteristics that govern groundwater flow. These joints, exfoliation sheets, fractures, faults and subsequent differentiated granitic intrusives, dikes and sills, create natural pathways and containment features which affect groundwater movement.

An analysis of granitic terrain for hydrologic capabilities utilized topographic features, aerial infrared mapping and botanical studies. This information serves to delineate features that show probable continuity with subsurface water flow. In addition it is recognized that the soil mantle (see Soil, Section 5.200, acting as a filtration and containment system which facilitates percolation and subsequent recharge to the fissure crack system, functions as a temporary water reservoir, subject to the effects of fluctuating precipitation.

At present, specific granitic groundwater basins in Mariposa County have not been studied in depth. However, appreciable to Mariposa County, related studies of Sierran granitic terrains have been undertaken. These studies include: groundwater bearing characteristics in fractured crystalline rocks, structural interpretations or jointing patterns, a questionnaire on the specifics of hard rock wells and a study on the optimum depth of wells in crystalline rock.

An analysis of average characteristics of Sierran hard rock wells by A. Swanson indicates the following:[31]

1. Wells have a mean depth of 115 feet.

2. Average pump depth is between 80 to 100 feet.

3. Three to five gallons per minutes is the average estimated yield.

4. Most wells serve between two and three people.

5. The yield tests made by drillers and pump companies cannot always be relied upon, since they are usually of only one or two hours duration.

5.600 WATER QUANTITY

5.601 INTRODUCTION

One of the most critical developmental constraints of Mariposa County is year around water availability. This constraint is imposed by four factors;

1. The majority of all surface water is claimed by other jurisdictions which hold rights to the run-off from Mariposa County.

2. Approximately, only five percent of the annual precipitation enters the groundwater regime.[28]

3. Precipitation and hence potential groundwater recharge exhibits pronounced seasonal fluctuations as reflected in the following table.

Month	%	Acre Feet of Runoff
February	18.4%	533,000 Acre Feet
March	24.4%	707,600 Acre Feet
April	17.4%	504,600 Acre Feet
May	14.2%	411,800 Acre Feet
June through January	25.6%	742,400 Acre Feet
Total	100.0%	2,899,400 Acre Feet

4. Groundwater in Mariposa County is primarily contained in rock units that impose unique physical and chemical constraints.

At present, subsurface water supplies the majority of domestic, commercial and municipal needs. Until an adequate surface supply is made available, Mariposa County must continue to rely on subsurface supplies.

A. Surface Water Quantity

In 1965 the Department of Water Resources (Bulletin No. 131)[3] developed a preliminary study on Mariposa County water resources. Because of document length, the above study is incorporated by reference. At present, stream gauging studies are being done to gather additional information on the rate, amount and time of surface run-off which can be exploited in development of future municipal water sources.

B. Subsurface Water Quantity

Because of present patterns of groundwater consumption in Mariposa County, this section will clarify the inherent limitations of subsurface hydrogeology.

6. The month in which the well was drilled is a significant factor that affects the likelihood that a well will require deepening. Forty-three percent of the deepened wells were drilled when ground water levels are high November through the following April) vs. 31 percent of the total wells in the survey.

7. Only 36 percent of the owners had a measurement of the depth to water in their wells; only 6 percent had more than one measurement. The measurements would be useful to owners of wells that fail in dry years. They could anticipate the shortage from water level records and start conserving water at an earlier date, or attempt to augment their supply before the shortage caused serious inconveniences.

8. Wells located high on slopes or on top of mountains tend to have more seasonal variation in depth to water and yield.

9. Persons who are considering a move to the mountains should be aware of the realities: that over 15 percent of the holes are dry, that about half of the sites will require two or more wells, that even for a vacation cabin about one-quarter needed more than one well, and that only a small percentage of the best wells support a modest amount of irrigation or extensive landscaping.

   A typical domestic well is 50 to 200 feet deep and produces less than 10 gallons per minute. However, since drilling of a domestic well is usually stopped when 5 to 10 gallons per minute are obtained, these low yields are not representative of the maximum yield obtainable. Large yields (greater than 50 gpm) can probably be developed at some locations, but storage and recharge to sustain them will not always be present.

   Topographic position is a significant factor in predicting the success of a hard-rock well. Those at the base of the slope or in a valley are more likely to produce a useful amount of water than those on the side or top of a mountain.

   Yield estimates, based on short tests of a few hours duration or less, are sometimes too optimistic. In particular, estimates made in the winter or spring when water levels are high should be viewed with suspicion.

10. Some of the factors which may be used to rate individual sites are topography, evidence of rock fracturing, storage capacity of the rock and soil above the well location, and the amount of catchment area that may be expected to recharge the ground water that the well is tapping. Proper evaluation of these factors would result in a decrease in the percentage of unsuccessful wells.

Jointing features influence well depth in crystalline rock. Research indicates a direct correlation between depth, porosity and specific yield. Davis and Turk discuss this important relationship in the following abstract:

"Water-bearing properties of crystalline rocks are dependent on the occurence of joints and faults and the extent of weathering. Interstitial openings caused by weathering are mostly at depths of less than 100 feet. Joints are less abundant and openings along joint planes are smaller as depth increases. Openings along fault surfaces also tend to close with depth. These geological observations which indicate a decrease in rock permeability with depth are verified by a study of well yields and water-injection tests. Mean yields per foot of well are 0.23 to 0.30 gpm at 100 feet but only 0.013 to 0.04 gpm at 1000 feet. Mean injection rates per foot of drill hole under 100 psi pressure are 0.11 to 0.4 gpm at 100 feet but only 0.014 to 0.038 gpm at 1000 feet. Median values of both well yields and injection rates are from one-half to one-third of the mean values. Geologic structure is more important than rock type in determining yields and injection rates. The decrease in rock permeability with depth indicates an increase in the unit cost of water with depth. The optimum depth of a well is, therefore, determined largely by economic factors. Unless geologic factors are favorable, wells in crystalline rocks should be less than 600 feet deep. In general, domestic wells should be less than 150 to 250 feet deep."

They conclude that:

1. The water-bearing characteristics of most crystalline rocks are primarily controlled by weathering and structure. Rock type alone is commonly of secondary importance.

2. In the absence of geological and geophysical guidance, drilling in crystalline rocks encounters highly variable amounts of water. In unweathered rock, from 5 to 15 percent of the wells are failures, median yields are less than 8 gpm, and roughly 10 percent will have yields of 50 gpm or more.

3. Water production per foot of well decreases rapidly with an increase in well depth. This decrease is roughly ten-fold between depths of 100 and 1000 feet.

4. The optimum depth of water wells in crystalline rocks is determined largely by economic factors unless the geologic structure is known in detail.

5. Although a detailed economic study was not made, rough estimates suggest that the depth of single domestic wells should be less than 150 to 250 feet and wells of larger production should be less than 600 feet. In many places the optimum depth of domestic wells will be less than 100 feet.

5.603 METAMORPHIC HYDROLOGY

Metamorphic formations in Mariposa County show remarkable hydrologic versatility because of the pressure of the following: bedding planes, parrallel rock units of varying resistancy, numerous brecciated shear and fault zones and variable permeability in surface area.

A geologic study during 1968[30] investigated Jurassic metavolcanic sequences also found in Mariposa County and concluded:

"Solid metamorphic rocks have porosities of less than three percent and most commonly less than one percent. The few pores that are present are small and generally are not interconnected. As a result, permeabilities are so small that they can be regarded as zero for all practical purposes. However, appreciable porosities and permeabilities are developed through fracturing and weathering of the rock. The permeability of fresh metamorphic rock, therefore is by virtue of its joints, faults, bedding-plane partings, solution enlargement of these secondary features, and geologic contacts.

Highly fractured zones in the Sierra Foothills are known to carry large amounts of water. The fracture zones are almost always associated with small scale faulting. Jointing, usually in several sets, is invariably present. Joints usually represent tensional or shear forces and are distinguised from faults in that there has been no visible movement parallel to the surface of the joint.

Tests (Davis and Turk) have indicated that permeabilities parallel with the old bedding-planes in metamorphic rocks are several times the average permeability. Contact zones between major rock types commonly are represented by fracturing and deformation. The deformed rocks tend to develop water-bearing fractures near discontinuities such as along hard, brittle quartz veins which cut soft phyllite. Some of the metamorphic rock contains carbonate minerals which are subject to relatively rapid solution by circulating ground water. Dissolution of certain unstable minerals associated with quartz dikes in the metamorphic rocks also increases local permeability."

Furthermore, it points out relationships between topography and well yields.

"Limited data suggest that the highest well yields are in or close to broad ravines. Many ravines reflect erosion along structurally weakened rocks. The weakness is due to closely spaced joint systems or fault zones, which explain the higher yields of the wells."

The structure of metamorphic formations play an equally important role in well development.

"Observation of joints, faults, and bedding planes at this project indicate that these features are usually close to vertical. Spacing between joints is generally greater than five feet. Owing to the single orientation of

most water-bearing fractures, permeability of the rocks as a whole is strongly anisotropic. Wells that are near vertical will, therefore, bend to intersect only a very few water-bearing crevices.

Horizontal wells in this terrain can be much more successful because of the greater number of fractures which will be intersected. However, the expense of drilling or excavating large vertical shafts and of drilling the laterals is sometimes much greater than the value of the water produced. Nevertheless, horizontal wells have been profoundly successful in deeply weathered rock or hillsides where horizontal drilling can start from the surface."

The writer concludes that the framework for an analysis of Mariposa County groundwater system is present. Only basin studies and a synthesis of existing data is necessary to gain adequate knowledge of present conditions and future trends.

5.604 WATER QUALITY

The groundwater of Mariposa County is altered through primary and secondary modification. Primary modification occurs during the interaction of groundwater* with minerals contained in rock. Secondary modification includes biologically induced chemical alterations whether natural or developed by man. As a result of these modifications, waters contract unique geological and biochemical characteristics. The Piper Trilinear Diagram assists in plotting relative abundances of dissolved ions and "fingerprints" waters. This "fingerprint" reflects the close relationship between the groundwater and the hydrogeology.

A. Igneous Primary Modification Conditions

Three regimes are recognized in Mariposa County: Two occur in igneous and metamorphic rock and the third occurs in alluvium.[34] Granitic rocks contain meteoric water classified as calcium bicarbonate. When migration occurs in fractures and joint structures, a higher dissolved solid content and pH can result, indicating an intermingling with surface waters. These meteoric surface waters exhibit lower concentrations of dissolved solids and pH, a consequence of migration through soil material and weathered rock mantle. Locally, granitic areas exhibit quartz intrusions with sulfide alterations that can affect water through reduction and oxidation processes associated with fluctuating groundwater.

Current studies by Mack, Schmidt and Ferrel have examined a region,[22,23] informally recognized as The Foothill Lineament, that yields high percentages of sodium chloride and conclude that this salt water lays

*Three classifications of water exist:[14]

1. Meteoric: Primarily from Precipitation
2. Juvenile: " derived from magmatic sources
3. Connate : "Fossil" marine waters

trapped in a fault system connecting the Bear Mountain/Melones Fault and the Kings-Kaweah suture zone. This lineament appears south of Mormon Bar, Cloos, 1932,[11] and continues southward to the Oakhurst roof pendant. Along the southern extension of this lineament, deep wells have punctured the granitic cap tapping salt water.[22] This water is present in undefined regions of the lineament and as water supplies diminish deep wells may tap this unacceptably saline water.

B. Metamorphic Primary Modification Conditions

The Mesozoic Metamorphic rock sequences of Mariposa County, of marine origin (See Geology, Section 5.100), represent a unique hydrologic regime.

With deposition of oceanic sediments, marine flora and fauna accumulated and decayed on the ocean floor. Through anerobic decomposition, sulphur compounds developed and during subsequent metamorphism, were altered to pyrites and associated minerals. These minerals, now interbedded in these rock units, are susceptible to chemical and bacterial processes that produce by-products such as hydrogen sulfide gas which smells like rotten eggs, and traces of heavy metals.

C. Mine Drainage

Mineralized areas contain heavy metals and form compounds that dramatically alter geo-hydrological conditions. Some mining techniques leave tailing piles on the surface which through percolation and ion exchange introduce unwanted compounds into the hydrologic system. (Presently investigating the impact of mine drainage on water quality is the Central Valley Regional Water Quality Control Board).[36]

D. Secondary Modifications - Septic

Septic systems, according to Schmidt,[28] recycle 80 to 90 percent of the pumped water in the mountains. Although dilution through adequate surface area and dispersal within existing groundwaters lessens contamination potential, effluent increase the salinity and nitrate level in addition to containing chemicals highly mobile in solution, all of which avoid the physical filtering processes. In a recent Environmental Impact Report[1] for a subdivision containing 20+, 5 acre homesites, the septic report concluded that septic effluent will gradually displace natural groundwater resources.

Enforcement of state, federal and county laws and ordinances is the responsibility of the county sanitarian, who may refuse to approve septic installations or require tests on any system or well that appears questionable.

E. Secondary Modification, Surface Water

Three topographic drainage basins occur in Mariposa County: The Merced River Drainage, the Chowchilla River Drainage and the Eastern Merced County Stream Group. Water quality concerns for surface drainages include turbidity from accelerated erosion, coliform bacteria from septic effluent and biological oxygen demand (B.O.B.) from the decomposition of organic material.

The Merced River was analyzed in the General Management Plan of Yosemite National Park Environmental Impact Report and although the ambient levels of B.O.D., suspended solids, and turbidity was unknown, they felt that the further development of Yosemite would not further degrade existing conditions. A substantial report was prepared on the water quality of the Merced River by the Department of the Interior and has developed data on conditions existing during the study period 1973-74.[4]

The sediment transport regime for the Chowchilla River System was analyzed by Helley[7] and should be consulted for further research on the turbidity of this basin system.

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6.000 MARIPOSA PLANNING AREA INVENTORIES

6.100 INTRODUCTION AND SCOPE

The following contains an overall inventory and analysis of nineteen planning areas within Mariposa County. Each planning area inventory contains a general description of the planning area including location, land area, general land use characteristics, terrain and plant climate, and unique characteristics. A public facility inventory is also included.

Future upgrading of these inventories will include a development inventory and analysis of growth potential. The information developed in this section was first included in a "701" grant report prepared in August of 1980.

MARIPOSA COUNTY PLANNING AREAS

Exhibit III

6.200 PLANNING AREA SURVEYS

6.201 BEAR VALLEY PLANNING AREA

I. GENERAL DESCIRPTION

A. Location: The planning area is named for the Town of Bear Valley, located approximately 12 miles northwest of the Town of Mariposa at the intersection of Highway 49 and the Bear Valley-Hornitos Road (Road J-16). The planning area is generally described as an area three miles wide and eight miles in length, lying between the Bagby Bridge to the north; Fremont Peak to the east; Mt. Ophir to the south; and Cow and Calf Gulch to the west.

B. Land Area: 13,437 acres.

C. Land Use Characteristics:

Community Centers: The Town of Bear Valley provides a small neighborhood gorcery and gasoline service station. Although individual mail box delivery is available, some of the residents outside of the town receive their mail at the store. The store, therefore, services not only a commercial purpose, but also provides an unofficial community service.

There is also a restaurant which historically dates to the 1850's which not only serves local customers, but is a stopping place for tourists and draws customers from throughout Mariposa and neighboring counties.

General and Regional Service Centers: The Town of Mariposa serves the general needs of the residents, while Merced (40 miles west) and Modesto (70 miles northwest) serve as regional service centers.

Public Lands: The U.S. Bureau of Land Management controls 999 acres in the planning area.

D. General Terrain Characteristics: The central area extending along Highway 49 is a valley approximately 1900' in elevation. The westernmost area rises to approximately 2700', while the easternmost boundary rises to between 3500' and 4000' just below Fremont Peak. The northern boundary dips to approximately 1000' at the Bagby Bridge.

The area's watershed is drained primarily by Bear Creek, which originates a mile southeast of the Town of Bear Valley. The northern watershed drains directly into the Merced River. The only floodplain runs along the southern bank of the Merced River. Other surface drainage includes Cow and Calf Gulch and Norwegian Gulch, both of which are tributaries of Bear Creek.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are approximately 58°, ranging from a minimum mean winter temperature of approximately 32° to a maximum mean summer temperature of 94°. The average seasonal precipitation is 25", while the average seasonal snowfall is about five inches. The average date by which soil moisture is exhausted is between June 10 and June 20.

Plant Climate Zone A - At elevations to 1300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Decidous Fruit Thermal Zone, Rice-Bermuda grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1 1/2 animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plantclimate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possible late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plantclimate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnut and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

F. Unique Characteristics of the Planning Area: The area is marked by a number of mines, including the Josephine and Pine Tree at the northern end and Mt. Ophir at the southern end. Various ruins and intact buildings dating from the mid- to late- 1800's remain in the area. Along Highway 49 north of Bear Valley are views of quartz ledges which comprised the Mother Lode.

In the eastern portion of the planning area in a northwesterly-southeasterly direction lies the Melones Fault, a part of the Foothills Fault System. The Melones Fault enters the planning area as it crosses the Merced River in the area of the Bagby Bridge.

II. Public Facilities and Services Inventory: Students from this area are bussed to Mariposa elementary, junior high, and high schools.

The area is served by the Bear Valley Volunteer Fire Department for structural fire protection. The dispatch agency is CDF, which has responsibility for wildlands protection.

Residents have individual responsibility for transportation of solid waste to the County solid waste disposal site north of the Town of Mariposa.

Within the planning area boundaries, a private marina and recreational area are located at the Bagby Bridge on the Merced River. Parks, swimming pool facilities, and tennis courts in the Town of Mariposa are utilized by residents. Hunting and fishing areas exist within the planning area.

Library facilities in the Town of Mariposa serve the planning area.

6.202 BOOTJACK PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area, which is characterized by its relationship to the Community of Bootjack (located in the northern half of the planning area at Highway 49 and Darrah Rd.), is an area approximately 7½ miles wide and 14 miles long. The area can be generally described as having its western boundary lying along the ridge west of Allred and Ashworth Roads extending south along Stripped Rock and Split Rock Creeks; the north boundary extends from Old Allred Road to a point 2 3/4 miles north of Triangle Road on Snow Creek, then to the intersection of Triangle, Darrah, and Westfall Roads, then easterly along Chowchilla Forest Rd; the eastern boundary runs along Oliver Creek and the east fork of the Chowchilla River; the southerly boundary is the Mariposa-Madera County Line.

B. Land Area: Includes 67,059.2 acres.

C. Land Use Characteristics:

Community Centers: Within the northern portion of the planning area are three very small commercial service areas as follows:

Bootjack - Within the TPA located at the intersection of Darrah Road and St. Highway 49. There are a few service-oriented business establishments such as auto repair, electrical contracting, and well drilling. There is also a grocery store with a gasoline pump. Mariposa Telephone maintains a telecommunications center in the area. A short distance away on Cole Road is a plant nursery. Across Highway 49, out of the TPA, is a retail lumber business.

Lushmeadows - Within the subdivision is a grocery store with gasoline pumps. There is also a restaurant which attracts customers from other parts of the County.

Triangle Road - South of the intersection of Triangle and East Westfall, there is a grocery store with gasoline pumps and a feed store.

General and Regional Service Centers: The Town of Mariposa serves the general needs of residents, while Merced (50 miles west) and Fresno (80 miles southwest) serve as regional service centers.

Public Lands: U.S. Bureau of Land Management controls 6.43 acres. There are 1,526.4 acres under management of the U.S. Forest Service. Total public land ownership is 1,532.83 acres or 2.29% of the planning area.

D. General Terrain Characteristics: This planning area presents more varied terrain characteristics than any other planning area. Elevations range between 1000' and 1500' in the southwestern foothills, to 3000' in the northwestern portion. In the eastern part of the planning, southerly elevations range from 2000 to 2800 feet, while northerly elevations range to 5000' with 5700' peaks. The forks of the Chowchilla River cut moderate canyons of 300' to 700' from surrounding elevations. Triangle Road, running east-west is about 3000' in elevation. Topography in the southern foothills is rolling to moderately steep.

The area's watershed is drained to the south by creeks which are tributaries of both the West, Middle and East Forks of the Chowchilla River.

Flood plains exist along the West Fork of the Chowchilla river from above the confluence of Jones and Snow Creeks to the County line, including areas above the confluence of the river and Humbug, Italian, and Blade Creeks. Flood plains of the Middle Fork of the Chowchilla begin north of Tip Top Road and extend south to the County line. The East Fork of the Chowchilla River is more well contained, having floodplains only near State Highway 49 and for a distance above the County line. A large pond on Magoon Creek near Lushmeadows is also included as a special hazard area along with the aforementioned on HUD Flood Hazard Boundary Map #15.

E. Plant Climate/Rainfall: Because of the area's varied geography, this information has been divided into elevation groupings:

	Lower 1,000-2,400	Middle 2,400-4,000	Upper 4,000-6,000
Mean Annual Temperature	58°	56°	54°
Minimum Mean Winter Temperature	32°	30°	28°
Maximum Mean Summer Temperature	94-96°	94°	90-92°
Average Seasonal Precipitation	20-25"	30-35"	40"
Average Seasonal Snowfall	1-5"	10-25"	50"
Average date by which soil moisture is exhausted	June 10	June 10-20	June 20-30

Plant Climate Zone A - At elevations to 1,300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1 1/2 animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnut and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

Plant Climate Zone D - This zone is above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success.

The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

F. Unique Characteristics of the Area: The planning area has been the area of the County with the most intense pressure for development both from the standpoint of subdivision of land and for the issuance of building permits. A majority of recent past County population growth has occurred in the northern half of the area. The area's scenic beauty, better than average road system (as compared to other parts of the County), access to the State Highway, higher elevations, plus proximity to Mariposa make it a particularly desirable development area.

Because of the large numbers of creeks and meadow areas at moderate and higher elevations, these areas may be considered ecologically and archaeologically sensitive.

II. PUBLIC FACILITIES INVENTORY

Students from this area are bussed to Woodland School (K-6), which is located near Bootjack at Highway 49 and Hirsch Rd. Students in grades 7-12 are bussed to the junior high and high school in Mariposa.

The old Darrah School and site, located at Darrah and Triangle Roads, is presently managed by the County Parks and Recreation Department as Darrah Park. Facilities on the one acre site consist of a community hall with kitchen facilities, picnic benches and fireplaces, water system, parking area, and playground equipment. Residents of the area also utilize swimming and tennis facilities in the Town of Mariposa. Hunting and fishing areas are available in U.S. Forest Service Lands.

The area is served by volunteer fire fighting units at Lushmeadows and Indian Peak, both within the planning area, and Mormon Bar to the west of the planning area. There is a need for a volunteer unit in the Bootjack area.

Residents have individual responsibility for transportation of solid waste to the County solid waste site on Highway 49, three miles north of the Town of Mariposa. There may be a transfer facility located in the area near Bootjack within the next few years.

Library facilities in the Town of Mariposa serve the planning area.

6.203 BRIDGEPORT PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for its relationship to a historical site which was called Bridge port and was located near where Old Highway crosses Aqua Fria Creek. The planning area is approximately 6 1/2 miles wide and approximately 7 miles in length, and can be generally described by the following boundaries: The western boundary lies between Ranges 18 and 19 to the north line of Township 6S then jogs to the west one section and extends beyond Hwy. 140; the northern boundary runs along or near 140 to the Mariposa TPA line; the eastern boundary follows the TPA line southeasterly to a point west of Mormon Hills, then follows the TPA line southeasterly to a point west of Mormon Hills, then follows to the south of Mormon Hills to Spring Creek, then directly south to Silver Bar Road then along Silver Bar Road to begin the southern Boundary; the southern boundary follows Silver Bar Road, Beach Road, White Rock Road, and Mariposa Creek to the beginning.

B. Land Area: 30,358 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The Town of Mariposa serves the general needs of residents, while Merced (40 miles west), Fresno (85 miles southwest), and Modesto (70 miles northwest) serve as regional service centers.

Public Lands: There is no public land ownership in this area.

D. General Terrain Characteristics: The lowest elevations, ranging from 1500' to 1700' are located in the central part of the planning area along Buckeye Creek. To the north, slopes are moderately steep, with ridge lines at 2500'. To the west lies the Guadalupe Mountain Range with steep slopes and peaks to 2800'.

The area is drained primarily by Mariposa Creek and its tributaries. A floodplain is located along Mariposa Creek from the eastern to western boundaries of the planning area.

E. Plant Climate/Rainfall: Mean annual temperature is approximately 58°, ranging from a minimum mean winter temperature of approximately 32° to a maximum mean summer temperature of 94°-96°. The average seasonal precipitation is approximately 20" to 25", while the average seasonal snowfall is 1" to 5". The average date by which soil moisture is exhausted is between June 10 and 20.

There are two Plantclimate Zones in the area which are described as follows:

Plant Climate Zone A - At elevations to 1,300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1 1/2 animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on norhterly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

F. Unique Characteristics of the Planning Area: The Bridgeport area is currently experiencing tremendous development pressure for land divisions, major subdivisions, and building permits. Further, this situation is expected to remain into the future. A great deal of this activity can be attributed to the area's reasonably good circulation system, proximity to Highway 140 and the Town of Mariposa, and scenic beauty with rolling hills and scattered oaks. The area should therefore be monitored so that development activity can be provided with public services at reasonable levels and in a timely manner.

II. Public Facilities and Services Inventory: Students in the planning area attend Mariposa elementary, junior high, and high schools.

The Buckeye Volunteer Fire Department located within the planning area has been inactive recently; however, plans are currently in progress to reactivate the unit. When that happens, it could become the primary volunteer unit in the area. As of now, CDF would dispatch the Mormon Bar volunteer unit to the area for structural fires, with the Catheys Valley volunteer unit as back-up in the western portion of the planning area. CDF is responsible for wildlands fires. Also, the Bootjack volunteer unit is expected to become operational shortly, and could also be used as a back-up unit in the eastern part of the planning area.

Residents have individual responsibility for transportation of solid waste to the County solid waste disposal site north of the Town of Mariposa or to the transfer station in Catheys Valley.

Recreational activities are available to residents in the area in the Town of Mariposa, including parks, the swimming pool, and other active types of recreation. Library facilities are also available in the Town of Mariposa.

6.204 MT. BULLION PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area is approximately four miles square, with the Town of Mt. Bullion in the center. Mt. Bullion is located at the intersection of the Mt. Bullion cut-off (Squirrels Nest Road) and Highway 49. The northwestern boundary of the planning area lies just south of Mt. Ophir; the southeastern boundary abuts the Mariposa TPA line approximately 1 1/2 miles northeast of the Town of Mariposa; the southwestern boundary runs from the intersection of Victoria Gulch and the Old Toll Road to Highway 140 past Agua Fria Road; and the northeastern boundary is located approximately 1 3/4 miles east of Highway 49 from Lyons Gulch, crossing Whitlock Road to the Mariposa TPA line.

B. Land Area: 9,782 Acres.

Community Centers: No commercial center exists in Mt. Bullion, except for a small cafe which serves as a local gathering place. There is a non-demoniational church and church-owned school which attracts members and students from the planning area as well as other areas.

The Mariposa-Yosemite Airport is located in Mt. Bullion to the east of Highway 49. The future development of Mt. Bullion may be linked to potential plans for an industrial park near the airport.

General and Regional Service Centers: The Town of Mariposa serves the general needs of the residents, while Merced (40 miles west), Modesto (70 miles northwest), and Fresno (90 miles southeast) serve as regional service centers.

Public Lands: There is no public land ownership in the Mt. Bullion Planning area.

D. General Terrain Characteristics: Planning area elevations range from 2,000'-2,100' along Highway 49 to 1,700' at Victoria Gulch to the west, 2,500' east of Agua Fria, and 3,750' to the northeast beyond the airport.

The area's watershed is drained by a series of creeks and gulches which are tributaries of Agua Fria Creek draining to the southerly portion of the area. To the west several gulches drain to Bear Creek. There are no flood plains in the area.

E. Plant Climate/Rainfall: The mean annual temperature in the planning area is approximately 58°, ranging from a minimum mean winter temperature of approximately 32° to a maximum mean summer temperature of 94°. The average seasonal precipitation is 25 inches, while the average seasonal snowfall is 5 inches. The average date by which soil moisture is exhausted is between June 10 and June 20.

There are two Plant climate zones in the planning area which are described as follows:

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches,

apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone C - The elevations between 2400' and 4000' have limited use as pature in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnut and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

F. Unique Characteristics of the Planning Area: The planning area contains two sites of historic significance: (1) Agua Fria which no longer exists, but was the first County Seat of Mariposa County in 1850; and (2) the Princeton Mine for which the Mt. Bullion townsite was originally named.

Just to the east of Mt. Bullion lies the Melones Fault zone which intersects and follows Highway 49 directly east of the airport landing strip. This fault zone runs in a northwesterly-southeasterly direction. In the western-most portion of the planning area along the Mt. Bullion Cut-off is a small fault which lies in a northeasterly-southwesterly direction.

The State of California currently operates a California Youth Authority facility near the Town of Mt. Bullion east of Highway 49.

II. Public Facilities and Services Inventory: Students from this planning area are bussed to Mariposa elementary, junior high, and high schools.

The area is serviced by the Bear Valley Volunteer Fire Department for structural protection. CDF, the dispatch agency, has responsibility for wildlands protection and suppression.

Residents have individual responsibility for transportation of solid waste to the County solid waste site on Highway 49, three miles north of the Town of Mariposa.

Residents utilize recreational facilities at Lake McClure, Bagby, and in the Town of Mariposa. Hunting and fishing areas are limited in the planning area due to private land ownership, but such areas do exist in neighboring planning areas.

Residents use the library facilities in the Town of Mariposa.

6.205 CATHEYS VALLEY PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area is named for the community of Catheys Valley, which is located at the intersection of Highway 140 and the Hornitos Road. It encompasses an area 12 miles in width and approximately seven miles from north to south. The area is generally described as lying between Victoria Gulch and Bear Creek on the north; the Merced/Mariposa County line on the west; the southern edge of T6SO on the south; and the eastern boundary of Range 17E on the east, except for the northeastern corner which lies to the west of the Guadalupe Mountain Range.

B. Land Area: 53,443 acres.

C. Land Use Characteristics:

Community Centers: Catheys Valley serves the area by providing a post office, grocery store, service station, and a garage. Further east is a roadside restaurant and service station. Within this same area is a dinner house which attracts customers from neighboring counties as well as Mariposa. To the west of Catheys Valley on Highway 140 is a tavern, trading post, and feed/hardware store.

General and Regional Service Centers: The Town of Mariposa, 13 miles east of Catheys Valley, serves the general needs of residents to some extent; however, because of the proximity of the area to Merced, approximately 25 miles west, that city functions as a general as well as a regional service center. Other regional centers are Modesto (65 miles north) and Fresno (70 miles southwest).

Public Lands: Public land ownership is barely over 100 acres, and therefore insignificant in this planning area.

D. General Terrain Characteristics: The community of Catheys Valley is at an elevation of approximately 1300'. Only where the northeastern boundary meets the Guadalupe Mountains does the elevation rise above 2000'. The westermost part of the area drops to elevations of 400'. The terrain consists of gently rolling to moderately steep foothills, mostly covered by grasses and scattered oaks.

The area's watershed is drained by Bear Creek, Owens Creek, and Mariposa Creek, all of which run generally parallel in a southwesterly direction. Floodplains exist in scattered areas along the aforementioned creeks. An extensive floodplain surrounds the area of the Bear Creek Reservoir, which is located north of Highway 140 near the county line.

E. Plant Climate/Rainfall: The mean annual temperature of the area is 60° - 62°, ranging from a summer mean maximum temperature of 96° to 98° to a winter mean minimum temperature of 34°- 36°. The average seasonal precipitation is 15" with an average seasonal snowfall of less than 1". The average date by which soil moisture is exhausted is June 10.

The area is divided into two plant climate zones which are described as follows:

Plant Climate Zone A - At elevations to 1300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda Grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zones use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1½ animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

F. Unique Characteristics of the Planning Area: Because of the area's proximity to Merced, the area could conceivably develop into a bedroom community for the Merced area. Tempering this potential is the large percent of Agricultural Exclusive land (91% of the planning area).

Bear Creek Reservoir is scheduled to be enlarged by the Army Corps of Engineers within the next few years. The extent or potential effects of this enlargement is unknown at the present time.

II. Public Facilities and Services: Students from this area in grades 1-6 attend the Catheys Valley School, which has two classrooms. Kindergarten students, depending on the location of their homes, are bussed to either Woodland Elementary School or the Mariposa Elementary School. Students in grades 7-12 are bussed to Mariposa junior high and high schools.

A County park and community center are located northeast of Catheys Valley on Highway 140. Facilities on the site include picnic benches, fireplaces, a water system, a paved parking area, lawn, and trees. It is anticipated that the community hall will be doubled in size in the latter half of 1980.

The area is served by a volunteer fire company which is located at the park site.

Residents have individual responsibilities for transportation of solid waste to the County solid waste site outside of Mariposa.

Library facilities in the Town of Mariposa serve the planning area.

6.206 CHOWCHILLA PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for Chowchilla Mountain, which is located near the center of the planning area. The area is approximately ten miles wide and six and one/half miles in length, lying between the South Fork of the Merced River on the north; Rush Creek and Big Creek on the east; Road 806 on the south; and Nutmeg Gulch, Sweetwater Creek, and Snow Creek on the west.

B. Land Area: 41,315 acres.

C. Land Use Characteristics:

Community Centers: The Chowchilla Planning Area has no established community centers at present.

General and Regional Service Centers: The Town of Mariposa serves the general needs of the residents, while Merced (60 miles west) and Fresno (80 miles south) serve as regional service centers.

Public Lands: The U.S. Bureau of Land Management controls 395 acres in the area, while the U.S. Forest Service controls 34,662 acres.

D. General Terrain Characteristics: The planning area is primarily mountainous, with steep slopes and peaks of more than 7000'. Much of the area ranges between 4000' and 5000' in elevation.

The area's watershed is drained by several creeks, some of which drain into the South Fork of the Merced River to the north. Others drain directly into the Merced River, and the rest drain into all of the forks of the Chowchilla River to the south of the planning area. The only flood plain is located along the South Fork of the Merced River.

E. Plant Climate/Rainfall: The mean annual temperature in the planning area is approximately 54°, ranging from a minimum mean winter temperature of approximately 24° to a maximum mean summer temperature of 90°. The average seasonal precipitation is approximately 40-45 inches, while the average seasonal snowfall is 50-100 inches, depending on elevation. The average date by which soil moisture is exhausted is approximately June 30.

The area is divided into two Plant Climate Zones, which are described as follows:

Plant Climate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnuts and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

Plant Climate Zone D - This zone, over 4000', is above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success.

The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

F. Unique Characteristics of the Planning Area: The planning area is relatively isolated in terms of circulation. Further, 84% of the area is under federal ownership and control. This combination has precluded significant development pressure in the area.

II. Public Facilities and Services: Students from this area are bussed to Mariposa High School and Junior High School; Woodland School serves grades K - 6.

The privately owned land in the area is served by the Lushmeadows Volunteer Fire Department and the Ponderosa Basin Volunteer Fire Department, while the National Forest Fire Station located just out of the planning area for both wildlands and structural fires and serves as the dispatch agency.

Residents have individual responsibility for transportation of solid waste to the County solid waste site on Highway 49 N or to the transfer station at Fish Camp.

There are campgrounds located within the planning area, while opportunities for hunting and fishing also exist.

Library facilities in the Town of Mariposa serve the planning area.

6.207 COULTERVILLE PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area is located in the northern part of Mariposa County above the Merced River. It can be generally described as an area nine miles wide and fourteen and one-half miles in length lying between the Mariposa/Tuolumne County line on the north; Indian Gulch, Greeley Hill Road and the Priest-Coulterville Road on the northeast; the Merced River, the North Fork of the Merced River to Indian Gulch on the east; the Merced River on the south; and Lake McClure along the middle of R 15E on the west.

B. Land Area: 42,621 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The Town of Coulterville serves the general needs of the residents, while Sonora (30 miles north) and Modesto (54 miles northwest) serve as regional service centers.

Public Lands: The U.S. Bureau of Land Management controls 21,609 acres in the planning area, and the U.S. Forest Service controls 445 acres.

D. General Terrain Characteristics: Most of the Planning area is typical foothill land, with an average elevation of 1750'. Ridge lines rise to approximately 2500', while in the Horseshoe Bend area, peaks exceed 2700'. In the eastern part of the area, ridge lines rise to 3000'.

The area's watershed is drained by many creeks and streams, most of which drain into the Merced River and/or its North Fork. Floodplains exist along the Merced River and the Lake McClure shoreline; the entirety of Maxwell Creek within the planning area, Buckhorn Creek from just west of Highway 49 below the Town of Coulterville to its convergence with Maxwell Creek; and along the North Fork of the Merced River on the eastern boundary of the area.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are approximately 58°, ranging from a minimum mean winter temperature of 32° to a maximum mean summer temperature of 94°. The average seasonal precipitation is 25 - 30 inches, while the average seasonal snowfall is between 5" and 25", depending on elevation. The average date by which soil moisture is exhausted is between June 10 and June 20.

There are three Plant Climate Zones in the planning area which are described as follows:

Plant Climate Zone A - At elevations to 1300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1 1/2 animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnuts and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

F. Unique Characteristics of the Planning Area: Because of its location on the north side of the Merced River, this planning area is almost separate from the southern portion of the County because of the lack of access. Highway 49 comes through Coulterville from the south, but the 26 miles between Mariposa and Coulterville are full of curves and hair-pin turns, thereby making it a much longer trip than would normally be expected. Therefore, residents of this planning area have more contact in many ways with Tuolumne County to the north and Stanislaus County to the northwest than to the southern portion of Mariposa County.

The area is rich in historical sites and mines. The entire town of Coulterville is designated as a State Historical Landmark, and the old road to Yosemite runs through the planning area, with several historic sites along the way. Mines in the area produced millions of dollars in gold, and the area's mining history is as rich as the story of how the area was settled as towns and communities.

Most of the development in the planning area in recent years has centered around the Town of Coulterville, and there has been relatively little parcelization and subdividing in the area compared to other planning areas in the County.

II. Public Facilities and Services Inventory: Students from this area attend the Coulterville-Greeley Hill School for grades K - 8. High school students are bussed to Mariposa High School.

The area is served by the two units of the Coulterville Volunteer Fire Department for structural fire protection. The dispatch agency is CDF, which has responsibility for wildlands protection.

A county service area provides sewer and water systems for the Town of Coulterville, and residents have individual responsibility for transportation of solid waste to the County transfer station in Coulterville.

Recreational facilities in the area are primarily located along Lake McClure and the Merced River and its North Fork, providing water sports and fishing. The Horseshoe Bend Recreational Area on the north side of Lake McClure offers camping, boat launching, and other facilities. Hunting is also available in the area.

A County-owned park is located in Coulterville. Facilities there include a swimming pool, dressing rooms, restrooms, a picnic area, lights, horseshoe pits, playground equipment, and tennis courts. The park is two acres in size.

The Coulterville Branch Library serves the residents of the area.

6.208 DON PEDRO PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for the Lake Don Pedro subdivision which stradles the Mariposa/Tuolumne County line. It is located in the extreme northwestern portion of the County, and is approximately six miles wide and fifteen miles in length. The area can be generally described as lying between the Mariposa/Tuolumne County line on the north and west; Lake McClure on the east along the middle of R 15 E; and the Merced River and Lake McSwain on the south.

B. Land Area: 41,786 acres.

C. Land Use Characteristics:

Community Centers:

Present populations in this planning area are not sufficient to support local community facilities, although future growth and existing land use patterns indicate that a local service center will develop in the area of Barretts Cove Road and Merced Falls Road.

General and Regional Service Centers: Small stores within the recreational areas and the community of Coulterville serve the general needs of the residents. Sonora (40 miles north), Modesto (45 miles west), and Merced (45 miles southwest) serve as regional service centers.

Public Lands: The U.S. Bureau of Land Management controls approximately 4,149 acres.

D. General Terrain Characteristics: Most of the area is general foothill terrain located at approximately 1,000' to 1,500', with ridge lines and peaks rising to 2,500' in the Penon Blanco area. The area abuts both Lake McClure and Lake McSwain, and some areas around the lakes the elevation dips to below 1,000'.

The area's watershed is primarily drained by the Merced River and the lakes; the primary streams are Piney Creek, Hayward Creek, Browns Creek, and Dry Creek. Piney Creek and its smaller tributaries flow into Lake McClure, while the other creeks drain into the Merced River downstream in Merced County. Floodplains in the area lie along the area's eastern area on the west side of Lake McClure, along the north side of the Merced River, and along the north side of Lake McSwain, the southern boundary of the planning area.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are approximately 62°, ranging from a minimum mean winter temperature of approximately 34° to a maximum mean summer temperature of 96°. The average seasonal precipitation is 25 - 30 inches, depending upon elevation, and the average seasonal snowfall is 1 - 5 inches. The average date by which soil moisture is exhausted is June 10 to June 20.

While most of the planning area lies within Plantclimate Zone A, a small portion in the northern part of the area falls into Plantclimate Zone B. These zones are described as follows:

Plant Climate Zone A - At elevations to 1,300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda Grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses into winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1½ animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, and digger pine.

F. Unique Characteristics of the Planning Area: The most notable characteristic of this planning area is its wealth of recreational opportunities. Its proximity to three major lakes and the Merced River has been the major attraction to the Don Pedro subdivision which was developed by Boise Cascade several years ago. While the water and sewer systems, streets, and golf course have been there for some time, the build-out rate has been slow, resulting in a vast majority of un-improved lots in the planning area. The dichotomy of this situation is that the Don Pedro planning area has more public services and facilities than most other planning areas in the County, while also having one of the lowest build-out rates and one of the largest percentages of undeveloped lots.

The area is marked by one of the unique geological formations in the County. Located in the north part of the planning area near Coulterville, this was the site of a single vein-filled fissure which stands out from among all of the other veins in the area because of its prominence and size.

II. Public Facilities and Services Inventory:

Students from this area are bussed to the Coulterville-Greeley Hill School for grades K - 8, and to Mariposa for grades 9 - 12.

CDF is the dispatch agency for wildlands and structural fires, and has primary responsibility for protection and suppression of wildlands fires. For structural fire protection, CDF would dispatch the Coulterville volunteer units to the north area above Lake McClure, and the Don Pedro Volunteer Fire Department out of Tuolumne County to the protion of the planning area southwest of the lake. This can be carried out because of a mutual aid agreement between Tuolumne County and CDF.

Residents have individual responsibility for transportation of solid waste, although a 160 acre site has been deeded to the Lake Don Pedro subdivision for its exclusive use when it is needed in the future.

The portion of the planning area within the Lake Don Pedro subdivision is served by a privately owned water and sewer system and a County sewer zone. Proceedings are now in progress to consolidate these systems into a community services district.

There are many recreational opportunities in the area, mostly related to use of the lakes. Major recreational centers are located at Barrett's Cove and McClure Point on Lake McClure and at the McSwain recreational area on that lake. Camping, boating, and picnic facilities are available at all of the recreational areas, and there is a private marina and boat club at the McClure Point area. A golf course is located at the Lake Don Pedro subdivision, but is open only to residents and their guests or other golfers who join the club. Fishing, water skiing, and other water sports are the predominant active types of recreation.

6.209 EL PORTAL PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for the community of El Portal, which is located just outside of the Yosemite National Park boundary on Highway 140. The area is generally described as being eight miles wide and eight miles in length, lying between the Yosemite National Park boundary on the north; the Yosemite National Park boundary and Zip Creek on the east; the South Fork of the Merced River on the south; and Ned Gulch and the South Fork of the Merced River on the west.

B. Land Area: 32,400 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The community of El Portal and the Town of Mariposa serve the general needs of the residents, while Merced (80 miles southwest) serves as the regional service center.

Public Lands: The U.S. Forest Service controls 29,971 acres and the National Park Service has an administrative site of 1,379 acres.

D. General Terrain Characteristics: The area is mountainous with elevations ranging from 2000' on the floor of the Merced River canyon to over 6000'. There are many creeks and streams in the area's watershed; most of these drain into the Merced River. Additionally, the South Fork of the Merced River converges with the river itself at the southwestern boundary of the planning area.

Floodplains in the planning area are located along the Merced River all through the area, and along the South Fork of the Merced River where it forms the area's southern boundary.

E. Plant Climate/Rainfall: The mean annual temperature is approximately 64°, ranging from a minimum mean winter temperature of 24° to a mean maximum summer temperature of 92°. The average seasonal precipitation is 35-40 inches, while the average seasonal snowfall is approximately 50 inches. The average date by which soil moisture is exhausted is between June 20 and June 30.

There are three Plant Climate Zones within the planning area which are described as follows:

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnuts and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

Plantclimate Zone D - This zone is above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success.

The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

F. Unique Characteristics of the Planning Area: This planning area serves as the western gateway to Yosemite National Park. Residents are therefore primarily employed in tourist-related services or by the federal government. El Portal is also the site of some administrative functions of the National Park Service. There are several historic sites in the area, including prehistoric Indian sites and the State Historical Landmark which designates the site of one of James Savage's trading posts.

II. Public Facilities and Services Inventory: Students from this area attend the El Portal school for grades K - 8, and are bussed to Mariposa for grades 9 - 12.

The area is served by the El Portal Volunteer Fire Department for structural fire protection. Wildlands fires are handled by both CDF and the federal agencies, with CDF the dispatch agency.

Solid waste from privately owned land in the planning area is hauled to the Mariposa County solid waste disposal site by the National Park Service.

There are many recreational opportunities in the planning area, including water sports, camping, hunting, and fishing. There is also a County Park in El Portal; its facilities include a swimming pool, tennis courts, and changing rooms.

6.210 GREELEY HILL PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area is named for the community of Greeley Hill which is in the approximate center of the planning area. The area can be generally described as seven miles wide and twelve miles in length, lying between the Mariposa/Tuolumne County line on the north; the North Fork of the Merced River on the east to the boundary of R 17 E; and Indian Gulch, Greeley Hill Road, and the Priest-Coulterville Road on the south and west.

B. Land Area: 41,331 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The community of Greeley Hill serves the general neess of the residents, while Sonora (38 miles north) and Modesto (62 miles northwest) serve as regional service centers.

Public Lands: The U.S. Bureau of Land Management controls a total of 7,015 acres; and the U.S. Forest Service controls 20,224 acres.

D. General Terrain Characteristics: The entire planning area is mountainous, with an average elevation of 3,500'. In Wagner Valley, the elevation dips to approximately 3,100', while Pilot Ridge in the northern portion of the planning area rises to 4,700'. Greeley Hill has an elevation of over 3,600' near the center of the planning area; the lowest area is along Indian Gulch at 2,000'. The area is drained by numerous creeks and streams, including Smith Creek, Moore Creek, Scott Creek and their tributaries. Most of the watershed drains into the North Fork of the Merced River. Floodplains exist along Bean Creek, Moore Creek, Jordan Creek, Deer Lick Creek, Maxwell Creek, and along the North Fork of the Merced River.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are 52° to 54°, ranging from a minimum mean winter temperature of 27° to a maximum mean summer temperature of 94°. The average seasonal precipitation is 30 - 35 inches, while the seasonal snowfall is 25" over most of the planning area. The average date by which soil moisture is exhausted is June 20.

The majority of the planning area lies in Plantclimate Zone C; however, a small section in the southern portion of the area lies in Plantclimate Zone B, and a small section in the northern portion of the area lies in Plantclimate Zone D. These zones are described as follows:

Plantclimate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plantclimate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnuts and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

Plantclimate Zone D - This zone is above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success.

The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

II. Public Facilities and Services Inventory: Students from this area attend the Coulterville-Greeley Hill School for grades K - 8, and are bussed to Mariposa at the high school level.

The area is served by the Greeley Hill Volunteer Fire Department for structural fire protection. The dispatch agency is CDF, which has responsibility for wildlands protection primarily for privately owned land.

Residents have individual responsibility for transportation of solid waste to the County transfer station in Coulterville.

There are opportunities for fishing and hunting within the planning area. Additionally, residents are served by the County-owned Red Cloud Park. Facilities there include picnic tables, a water system, night lights, barbecue pits, a deep-pit barbecue, and restrooms. The park is seven acres in size.

Library facilities in Greeley Hill are available to residents of the area.

6.211 HORNITOS PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area is named for the community of Hornitos, which is the only community in the area. It can be generally described as twelve miles wide and ten miles in length, lying between Lake McSwain, the Merced River, and Cotton Creek on the north; Cow and Calf Gulch to Victoria Gulch on the east; Victoria Gulch and Bear Creek on the south; and the Mariposa/Merced County line on the west.

B. Land Area: 52,304 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The community of Hornitos serves the general needs of the residents, while Turlock (30 miles northwest) and Merced (35 miles west) serve as regional service centers.

Public Lands: The U. S. Bureau of Land Management controls 562 acres in the planning area.

D. General Terrain Characteristics: The majority of the planning area is in low foothill terrain, with elevations ranging from 400' near the western boundary to 1,525' at Santa Cruz Mountain. The average elevation is approximately 1,000' to 1,500' on the ridge lines.

Major creeks and streams in the planning area are Cotton Creek on the northern boundary, Cow and Calf Gulch and Victoria Gulch to the east, and Burns and Hornitos Creeks. Most of these creeks form the watershed of Bear Creek and eventually drain through Merced County. Cotton Creek, however, drains directly into Lake McClure. Floodplains exist along the southern shoreline of Lake McClure and the Merced River; along Burns Creek through Hornitos; along Bear Creek; and along a portion of El Dorado Creek in a low-lying area.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are approximately 62° to 64°, ranging from a minimum mean winter temperature of 35° to a maximum mean summer temperature of 96°. The average seasonal percipitation is 15- 20 inches, while the average seasonal snowfall is 1". The average date by which soil moisture is exhausted is between June 10 and June 20.

A vast majority of the planning area lies in Plantclimate Zone A; however, some of the higher ridge lines in the eastern portion of the area lie in Plantclimate Zone B. These zones are described as follows:

Plant Climate Zone A - At elevations to 1,300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda Grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zones use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1 1/2 animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turf-grass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

F. Unique Characteristics of the Planning Area: The most unique characteristic of the planning area is the historic community of Hornitos. There are many historic buildings and ruins still available to enjoy, and the town most reflects the Mexican influence throughout Mother Lode country. Also, Hornitos was the only incorporated city in Mariposa County; it incorporated in 1961 and disincorporated in 1972.

The primary activity in the planning area besides tourism is mining and ranching. Little or no development activity has taken place in recent years.

II. Public Facilities and Services Inventory: Students from this area are bussed to the elementary school in Catheys Valley, and to Mariposa for junior high and high school.

The area is served by the Hornitos Volunteer Fire Department for structural fire protection. The dispatch agency is CDF, which has responsibility for wildlands protection.

Residents have individual responsibility for transportation of solid waste to the County solid waste disposal site on Highway 49 north of Mariposa.

Recreational facilities in the area center around the northern boundary, Lake McClure, Lake McSwain, and the Merced River, where water-related activities are available. Residents can also use the County-owned park in Hornitos. Facilities there include a community hall with kitchen facilities, picnic and fireplace areas, restrooms, playground equipment, and a basketball court.

Library facilities in the Town of Mariposa serve the planning area.

6.212 HUNTERS VALLEY PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area is located on the northside of the County, and is surounded on three sides by the Merced River and Lake McClure. It can be generally described as an area six and one-half miles wide and seven miles in length, lying between the upper portion of Lake McClure on the north; a portion of the northern boundary of the Bear Valley to the Bagby Bridge along the ridge line to the Merced River on the east; Lake McClure and Cotton Creek on the south; and Lake McClure on the west.

B. Land Area: 23,341 acres.

C. Land Use Characteristics:

General and Regional Service Centers: Small stores in the recreation area, and the Towns of Mariposa, Bear Valley, Hornitos and Coulterville serve the general needs of residents, while Merced (60 miles west) and Modesto (70 miles northwest) serve as regional service centers.

Public Lands: The U.S. Bureau of Land Management controls almost half of the planning area; those 11,659 acres.

D. General Terrain Characteristics: The average elevation of the planning area is 1,000' to 1,500' in typical foothill terrain. The elevation along the shoreline of Lake McClure on the north and west sides of the area dip to 750', while there are some ridge lines at approximately 2,750' and Williams Peak at 3,205' in the extreme southeastern portion of the area.

The primary creek in the planning area is Cotton Creek and its tributaries along the southern boundary, which drain into Lake McClure. There are a few small streams in the area's watershed which also drain into Lake McClure. Floodplains exist along the shorelines of Lake McClure and the Merced River, and along a short distance of Cotton Creek where it empties into Lake McClure.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are approximately 62°, ranging from a minimum mean winter temperature of 34° to a maximum mean summer temperature of 98°. The average seasonal precipitation is 15 - 20 inches, while the average seasonal snowfall is 1 - 5 inches, depending on elevation. The average date by which soil moisture is exhausted is June 10.

There are three Plantclimate Zones in the area which are described as follows:

Plant Climate Zone A - At elevations to 1,300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1½ animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is claimatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnut and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

F. Unique Characteristics of the Planning Area: This area is isolated in terms of access because it is surrounded on three sides by water. However, it does provide a wealth of water-related recreational activities. The area is lightly populated, with ranching and mining the major activities besides recreation.

Since one-half of the area is under federal control and the majority of the privately owned land is designated with relatively large minimum acreages, development and parcelization have been minimal. Most of the building permits and parcel splits are located in the southern portion of the area in the loosely designated community of Hunters Valley.

II. Public Facilities and Services Inventory: Students from this area are bussed to Mariposa elementary, junior high, and high schools.

The area is served by the Hunters Valley Volunteer Fire Department fro structural fire protection. The dispatch agency is CDF, which has responsibility for wildlands protection.

Residents have individual responsibility for transportation of solid waste to the County solid waste disposal site on Highway 49 or to the transfer station at Coulterville.

Within the planning area boundaries, a major recreation area is located on Lake McClure at Hunters Point. This area provides camping and boat launching facilities, as well as other water-related recreational activities.

Library facilities are available in Mariposa.

6.213 KINSLEY PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for the community of Kinsley, the only community within the planning area. The area is generally described as ten miles wide and 14 miles in length lying between the Mariposa/Tuolumne County line on the north; Ned Gulch on the east; the Merced River on the south; and the North Fork of the Merced River on the west.

B. Land Area: 61,584 acres

C. Land Use Characteristics:

General and Regional Service Centers: The communities of Coulterville and Greeley Hill serve the general needs of residents, while Modesto 75 miles northwest serves as the major regional service center.

Public Lands: The U. S. Bureau of Land Management controls 11,638 acres in the area, and the U.S. Forest Service controls 44,656 acres in the area.

D. General Terrain Characteristics: The planning area is primarily mountainous, ranging from approximately 2500' on the western side of the area to over 5,000' to the east.

There are several creeks draining the area, most of which comprise part of the watershed of the North Fork of the Merced River and the Merced River itself. Floodplains in the area are located along the North Fork of the Merced River on the west and the Merced River along the southern boundary of the planning area.

E. Plant Climate/Rainfall: The mean annual temperature is approximately 56°, ranging from a minimum mean summer temperature of approximately 28° to a maximum mean summer temperature of 92°. The average seasonal precipitation is 30 - 35 inches, while the average seasonal snowfall is between 25 and 50 inches. The average date by which soil moisture is exhausted is approximately June 20.

The planning area has three Plantclimate Zones, which are described as follows:

Plantclimate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Elevation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, and digger pine.

Plantclimate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnut and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

Plantclimate Zone D - This zone is above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success.

The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

F. Unique Characteristics of the Planning Area: The area is one of the most isolated in the County in terms of circulation. Further, 73% of the area is under federal ownership and control. The privately owned lands are primarily inholdings in the federal land rather than contiguous parcels. All of these factors have precluded significant development in the planning area.

II. Public Facilities and Services Inventory: Students from this area are bussed to Mariposa High School and to the Coulterville/Greeley Hill School for grades K - 8.

CDF and the U.S. Forest Service provide fire protection for both wildlands and structural fires in the summer. In the winter, CDF would dispatch the volunteer fire department in Greeley Hill, with the Forest Service as back-up.

Residents have individual responsibility for transfer of solid waste to the transfer station in Coulterville.

The Merced River and its North Fork provide recreational opportunities in the area; there are also camping facilities in the national forest. Hunting and fishing are also available both to residents and tourists.

Library facilities in Coulterville serve the planning area.

6.214 MARIPOSA PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for the Town of Mariposa, which is the County seat and the largest community in the County. The area can be generally described as three and one-half miles wide and six miles in length, lying between a point approximately 1 3/4 miles east of Highway 49 from Lyons Gulch and Whitlock Road and Snow Creek on the north; roughly paralleling Old Allred road along the ridge line on the east; Spring Creek to and crossing Ben Hur Road on the south; and along the ridge line parallel to Highway 49N on the west.

B. Land Area: 9,088 acres.

C. Land Use Characteristics:

Community Centers: The planning area is dominated by the Town of Mariposa, the largest community in the County with a population of approximately 1,600. Since Mariposa is the County seat, most governmental functions are centered there, except for a few branch offices in the north side of the County. Commercial and service facilities are available to residents and tourists alike. Located at the junction of Highways 49 and 140, major roads to Yosemite National Park and north through Mother Lode country, tourism is a crucial portion of the community's economic base. In addition to government, commercial and service facilities, Mariposa has the only high school in the County, the most extensive park, and the Mariposa County History Center, a unique museum among the Mother Lode counties. The County fairgrounds are located in Mariposa; these facilities provide a location not only for the district fair, but for numerous social and community events.

General and Regional Service Centers: The Town of Mariposa serves the general needs of the residents, while Merced (40 miles west) and Fresno (80 miles southeast) serve as regional service centers.

Public Lands: There are no public lands in the planning area except for County-owned facilities and the facilities of the Mariposa Public Utility District.

D. General Terrain Characteristics: The Town of Mariposa is located in a small valley between two ridge lines along Highway 140, at an elevation of approximately 2000'. The ridge along the western boundary of the planning area is approximately 2250', while the eastern ridge rises to 2500'. A few peaks in the northern portion of the planning area just south of Mono Camp rise to 3000'.

The area is drained by both Mariposa Creek and Stockton Creek and their tributaries. The northeastern portion of the planning area is an important part of the Stockton Creek watershed. Floodplains exist all along Mariposa Creek through the area, and for approximately one mile along Stockton Creek before it converges with Mariposa Creek near the fairgrounds in the southern portion of the area.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are 58°, ranging from a minimum mean winter temperature of 30° to a maximum mean summer temperature of 92° to 94°. The average seasonal precipitation is 30", while the average seasonal snowfall is 5". The average date by which soil moisture is exhausted is June 10.

Most of the planning area lies in Plant Climate Zone B; however, some of the higher ridges in the northern and eastern portion of the area lie in Plant Climate Zone C. The zones are described as follows:

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone C - The elevations between 2400' and 4000' have limited use as pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnuts and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

F. Unique Characteristics of the Planning Area: This planning area is dominated by the Town of Mariposa, which is one of the most historically important communities in the Mother Lode. In its role as the southernmost major town in the foothills along Highway 49, it offers tourists services, historic sites and places, and an acclaimed history center for the County. It is also located along one of the major routes to Yosemite National Park, and offers tourists bound to the Park the same services and opportunities as those heading for Gold Rush country. Mariposa is also the site of the oldest courthouse in the State which has been in continuous use, and the oldest newspaper printed under the same name in the State. With tourism a critical portion of Mariposa's economic base, it offers travelers with a wealth of service businesses and sightseeing opportunities.

Development has been limited in the planning area, because of several factors. The first is the lack of developable land within the area. Land use policies and zoning affect this shortage, as does the extensive portion of the northeastern portion of the area where development is precluded in the Stockton Creek watershed. Further, part of the Town of Mariposa is under the jurisdiction of the Mariposa Public Utility District; in recent months a moratorium on development has been placed within the District's boundaries because of lack of sewer capacity. Therefore, most development in recent years has taken place in the southern portion of the area near Mormon Bar, near the Bridgeport Planning Area boundary and the Bootjack Planning Area boundary. The two areas have the highest development rate in the County. Given the various factors discussed here, it seems improbable that the planning area will be subjected to intense development pressure in the near future.

II. Public Facilities and Services Inventory: Students in this planning area attend Mariposa elementary, junior high, and high schools.

The Mariposa Public Utility District provides structural fire protection to residents within and closely adjacent to its boundaries. In the southern portion of the area, CDF, the dispatch agency, would send the Mormon Bar volunteer unit; in the northern portion, Midpines volunteer unit would be dispatched. Up along Highway 49N to the planning area boundary, MPUD, Mormon Bar, and/or the Bear Valley volunteer units would be sent, with CDF serving as back-up and with responsibility for wildlands fire protection and suppression.

Residents within MPUD boundaries are served with sewer and water systems. Outside of the district boundaries, water is provided either by private wells or private water companies.

Residents have individual responsibility for transportation of solid waste to the County solid waste disposal site north of the Town of Mariposa.

Within planning area boundaries, recreation facilities are primarily provided through the use of school facilities and the County-owned park. This park, which is 14 acres in size, offers a swimming pool and dressing rooms; a picnic area with tables and fireplaces; an outdoor theater, stage, and storage area; tennis courts with nightlights; lawn and trees; playground equipment; and restrooms. This park is utilized not only by residents of the planning area, but residents throughout the County. There are also County-wide activities and facilities available at the County fairgrounds in the southern portion of the planning area.

Library facilities in the Town of Mariposa serve the planning area.

6.215 MIDPINES PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: This planning area is named for the community of Midpines, which is located in the southwestern portion of the area. It can be generally described as an area eleven and one-half miles wide and eight miles in length, lying between the Merced River on the north; Nutmeg Gulch, Sweetwater Creek, and Snow Creek on the east; a point approximately 1-3/4 miles east of Highway 49 from Lyons Gulch to Whitlock Road southerly to Old Allred Road, then along Old Allred Road to apoint 2-3/4 miles north of Triangle Road and Snow Creek on the south; and along the Bear Valley Planning Area's eastern boundary near Fremont Peak to the west.

B. Land Area: 49,126 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The community of Midpines and the Town of Mariposa serve the general needs of the residents, while Merced (50 miles west) and Fresno (85 miles southwest) serve as regional service centers.

Public Lands: The U.S. Bureau of Land Management controls 13,037 acres in the planning area, and the U.S. Forest Service controls 14,691 acres.

D. General Terrain Characteristics: The majority of the planning area is mountainous, with average elevations of approximately 3250'. On the northern boundary of the area, the elevation dips to 1000' along the Merced River, while ridge lines and peaks in the eastern portion exceed 4000'.

The area is primarily drained by Bear Creek and its tributaries, which in turn drain into the Merced River. In the western portion of the area, Sherlock Creek drains directly into the Merced River, while to the east, Sweetwater Creek and Snow Creek drain into the West Fork of the Chowchilla River outside of the planning area. Flood plains exist along the Merced River, the northern boundary of the planning area.

E. Plant Climate/Rainfall: Mean annual temperatures in the area are 54° to 58°, ranging from a minimum mean winter temperature of 30° to a maximum mean summer temperature of 92°. The average seasonal precipitation is 25 - 30 inches, while the average seasonal snowfall ranges from 10 - 25 inches, depending on elevation. The average date by which soil moisture is exhausted is between June 10 and June 20.

The majority of the planning area lies in Plant Climate Zone C; however, along the Merced River the area lies in Plant Climate Zones A and B, while in the eastern portion of the area some ridge lines and peaks lie in Plant Climate Zone D. These zones are described as follows:

Plant Climate Zone A - At elevations to 1300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1½ animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turf-grass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone D - This zone is above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success.

The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

F. Unique Characteristics of the Planning Area: This area, because of its accessibility and mountain forest environment has some of the highest property values in the County. Around the community of Midpines, most of the property has been parcelized or subdivided down to maximum acreage in the appropriate land use classification. This creates an area with small parcels and lots and also contributes to the high property values and the resulting substantial development activities in the area.

Highway 140 to Yosemite runs through the planning area, and there are many tourist-oriented facilities there, including resorts, campgrounds, restaurants, etc.

II. Public Facilities and Services Inventory: Students from this area are bussed to Mariposa elementary, junior high, and high schools.

The area is served by the Midpines Volunteer Fire Department for structural fire protection. The dispatch agency is CDF, which has responsibility for wildlands protection.

Residents have individual responsibility for transportation of solid waste to the County solid waste disposal site north of Mariposa on Highway 49.

Recreational opportunities within the planning area include fishing and hunting, as well as those facilities available at the resorts and campgrounds along Highway 140. Park facilities are available in Mariposa for residents of the area; library facilities are also available in Mariposa.

6.216 PONDEROSA PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for the Ponderosa Basin subdivision, which is the only development of any size within the area. The area is generally described as seven and one/half miles wide and seven and one/half miles in length, lying between Signal Peak Road on the north; Pilot Peak Road on the east; the Mariposa/Madera county line on the south; and Oliver Creek and the East Fork of the Chowchilla River on the west.

B. Land Area: 24,851 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The communities of Mariposa, Ahwahnee and Oakhurst serve the general needs of residents, while Fresno (65 miles south) serves as the regional service center.

Public Lands: The U.S. Forest Service controls 14,630 acres in the planning area.

D. General Terrain Characteristics: The planning area is primarily mountainous, with elevations ranging from 2300' to over 5000'. The area's watershed is drained by numerous creeks, most of which drain into the East Fork of the Chowchilla River. The others drain into the Fresno River in the southeastern portion of the planning area. Both floodplains in the area are located along the East Fork of the Chowchilla River; the largest area is where Highway 49 crosses the river, and the other is where the East Fork leaves Mariposa County and flows into Madera County in the extreme southern portion of the planning area.

E. Plant Climate/Rainfall: The mean annual temperature is approximately 54°, ranging from a minimum mean winter temperature of 25° to a maximum mean summer temperature of 90°. The average seasonal precipitation is approximately 40", while the average seasonal snowfall ranges from 50" to 100" at the higher elevations. The average date by which soil moisture is exhausted is between June 20 and June 30.

There are three Plant Climate Zones in the planning area, which are described as follows:

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites, air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

Plant Climate Zone C - The elvations between 2400' and 4000' have limited use for pasture in fall, winter, and spring. Deciduous fruits such as certain varieties of apples and walnuts and certain prunes are suitable, but peaches, apricots, and pears are subject to frost.

Plant Climate Zone D - This zone is above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success.

The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

F. Unique Characteristics of the Planning Area: This planning area contains the first major development, Ponderosa Basin, as Highway 49 comes northwest into Mariposa County. Because of its location and lack of nearby commercial facilities, residents of that area can be oriented toward both Mariposa to the north or the Ahwahnee/ Oakhurst area to the south.

The vast majority of development pressure in the planning area is contained within Ponderosa Basin, with little development activity scattered throughout the entire area. Because of this, growth can be monitored in that services can be planned for on a long-range basis.

II. Public Facilities and Services: Students from this area are bussed to Woodland Elementary School and Mariposa junior high and high schools.

The area is served by the Ponderosa Basin Volunteer Fire Department for structural fire protection. The dispatch agency is CDF, which has responsibility for wild-lands fire along with the U.S. Forest Service.

Residents have individual responsibility for transportation of solid waste to the County solid waste site. Recreational opportunities include hunting, fishing and camping.

6.217 WHITE ROCK PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for the white rocks in the area and for White Rock itself, a large outcropping of quartz in a mountain. White Rock was quarried out of existence in the mid-1950's in mining for silica. The planning area is generally described as an area 17 miles wide and 12½ miles in length, lying between the southern boundary of T 6S, Mariposa Creek, White Rock Road, Beach Road, and Silver Bar Road on the north; Striped Rock and Split Rock Creeks on the east; the Mariposa/Madera County line on the south; and the Mariposa/Merced County line on the west.

B. Land Area: 92,952 acres.

C. Land Use Characteristics:

General and Regional Service Centers: The Town of Mariposa and the community of Raymond serve the general needs of the residents, while Merced (30 miles west) and Madera (35 miles southwest) serve as regional service centers.

Public Lands: There are no publicly owned lands in the White Rock Planning Area.

D. General Terrain Characteristics: Most of the planning area is rolling hills and rock outcroppings which are suitable for grazing. In the southwestern portions of the planning area, elevations fall below 1000'; in the eastern area, elevations range between 1000' and 2000'. There are a few ridge lines and peaks which exceed 2200'.

There are several seasonal small streams draining the planning area. Most of these drain into Ganns, Owens, and Mariposa Creeks. There are several floodplains in the area along Mariposa Creek, Ganns Creek, Owens Creek, Deadman Creek, Miles Creek, and in scattered low-lying areas along smaller, seasonal streams.

E. Plant Climate/Rainfall: Mean annual temperatures in the area is between 60° and 62°, ranging from a minimum mean winter temperature of 34° to a maximum mean summer temperature of 96° to 98°. The average seasonal precipitation is 15 - 20 inches, while the average seasonal snowfall is 1 - 5 inches. The average date by which soil moisture is exhausted is May 31 to June 10.

There are two Plant Climate Zones in the planning area which are described as follows:

Plant Climate Zone A - At elevations to 1300' this is generally the warmest area within the County and contains the following recognized zones: Subtropical Thermal Zone, Deciduous Fruit Thermal Zone, Rice-Bermuda grass Zone.

The rolling terrain, shallow soil, and limited water supply, except in isolated pockets, restrict the zone's use of native grasses to winter grazing. Carrying capacity is one animal unit per acre per month. Where irrigation can be used, pasture can be seeded to orchardgrass and ladino clover with a carrying capacity of one to 1½ animal units per acre per month with a virtually unlimited grazing period.

The area is climatically suited to production of fall-seeded small grains such as oats, barley, and wheat without requiring supplemental water.

The area is a hardwood-grassland complex with chamise and Ceanthus on northerly slopes and cooler areas, with manzanita in the remainder. Scattered blue oak exist, with live oak adjacent to water areas. The dominant turfgrass is bermuda grass.

Evaluation of climatic limitations, exposures, and a growing season of 220 days are required for selection of row crops and ornamentals. Where suitable soil depth and irrigation are available, the area is capable of producing oranges, lemons, figs, apricots, peaches, walnuts, almonds, pecans, and table grapes. Frost protection may be required at the upper end of zone.

Plant Climate Zone B - The area lying between 1300' to 1400' and 2400' in elevation is climatically suited to walnuts and possibly late apples. Peaches, apricots, and wine grapes may be subject to frost. Evaluation of growing sites air drainage, windflow, and a growing season of 175-220 days are required for selection of row and vegetable crops and ornamentals. Dominate turf cover is bluegrass. This area is suitable for native grass pasture and fall-seeded small grains such as oats, barley and wheat. Predominant tree species are live oak, black oak, blue oak, and digger pine.

F. Unique Characteristics of the Planning Area: This planning area is unique in that all of the land within it is used exclusively for agriculture, and is zoned to reflect that use. Several ranches operate in the area and most of the land is in agricultural preserves under the Williamson Act. The result of this land use and ownership pattern is that there is currently little or no growth potential in the area.

In the area around the CDF station, chrystolites can be found; this is one of the few places in the world where they can be found.

In the early days White Rock was a landmark in that portion of the County because it was near the roads and trails to LeGrand. However, as previously mentioned the rock was mined out of existence by silica mining.

II. Public Facilities and Services Inventory: Students from this area are bussed into Mariposa elementary, junior high, and high schools.

There is a CDF fire station in the center of the planning area which serves as the dispatch agency and has responsibility for wildlands fires in the area. CDF would also serve as back-up to structural fires; however, depending on the location of a structural fire, CDF would dispatch the volunteer units from either Indian Peak, Mormon Bar, or Catheys Valley. If the volunteer unit from Buckeye is reactivated, it would also be called in some instances.

Residents have individual responsibility for disposal of solid waste.

Within the planning area boundaries, there are no recreation facilities. Hunting and fishing are limited by the large acreages under private ownership; however, most of the residents have large holdings and can use their own land for these activities.

6.218 YOSEMITE NORTH PLANNING AREA

I. GENERAL DESCRIPTION

A. Location: The planning area is named for Yosemite Naitonal Park. This northern part of the park is nearly 100% owned and controlled by the National Park Service. The only privately owned land is a few acres in the community of Foresta, which is located near the area's western boundary.

The planning area can be generally described as 23 miles wide and 18 1/2 miles in length, lying between the Mariposa/Tuolumne County line on the north and east; the Mariposa/Madera County line and Glacier Point Road on the south; and the Park boundary on the west.

B. Land Area: 190,992 acres.

I. GENERAL DESCRIPTION

A. Location: The planning area is named for Yosemite National Park, which comprises much of the planning area. Communities within the area are Fish Camp, Wawona, and Yosemite West. The area is generally described as being thirteen miles wide and sixteen miles in length, lying between Alder Creek and Glacier Point Road on the north; the Mariposa/Madera County line on the east and south; and Laurel Creek and Miami Mountain Road to Highway 41 on the west.

B. Land Area: 71,804 acres.

C. Land Use Characteristics:

Community Centers: The Yosemite South Planning Area has three growth areas amidst large areas of public land ownership. Wawona is an inholding of the Yosemite National Park, Yosemite West is a developed community center on the boundaries of the YNP and Sierra National Forest and Fish Camp is a community at the south entrance of YNP on Highway 41. Fish Camp and Wawona are designated as Town Planning Areas.

General and Regional Service Centers: Oakhurst serves the general needs of the residents, while Fresno (70 miles south) serves as the regional service center.

Public Lands: The National Park Service controls 59,183 acres which lie within the Yosemite National Park boundary, and the U.S. Forest Service controls 3,814 acres.

D. General Terrain Characteristics: The planning area is all mountainous with steep slopes and Alpine meadows. Elevations range from approximately 5000' to over 9000'.

The area's watershed is drained by numerous small streams which then drain directly into the South Fork of the Merced River. The only flood plain runs along both sides of the South Fork of the Merced River.

E. Plant Climate/Rainfall: There are two Plant Climate Zones in the planning area which are described as follows:

Plant Climate Zones D and E: These zones are above any commercial agricultural potential other than summer grazing in small areas relatively free of timber and timbering. Native grasses and forbs occur irregularly, and the carrying capacity is exceedingly low. Continued attempts to improve small clearings by seeding short season species has met with only limited success. The primary timber species are sugar pine, white and Douglas fir, ponderosa pine, and cedar.

At about the 6000' elevation alder, present at lower elevations in the more moist sites is replaced by aspen. Above 6000' the presence of lodgepole pine, dogwood, and bitter brush becomes evident.

F. Unique Characteristics of the Planning Area: This planning area is unique in that much of it is comprised by Yosemite National Park; only 12% of the land is privately owned. Most of these parcels are inholdings surrounded by public land. Wawona and the Yosemite west are within Park boundaries, while Fish Camp is located three miles from the Park's south entrance on Highway 41.

There are many historical sites within the planning area, including prehistoric Indian sites, the Wawona Hotel complex, and the Pioneer History Center at Wawona.

The area is heavily dependent on Park visitors as an economic base; further, most of the residences in Fish Camp and Yosemite West are second homes used for seasonal recreation.

The potential for development pressures is hindered by the lack of privately owned land available; therefore, most development can be expected to occur in Yosemite West as it is built-out, and in Fish Camp on the remaining available parcels.

II. PUBLIC FACILITIES AND SERVICES INVENTORY

Students from this area can go to elementary school either in the Yosemite Valley or down to Bass Lake with an inter-district transfer. Grades 7 and 8 can go to either Oakhurst or Bass Lake; high school students can go to either Mariposa High School or Yosemite High School in Oakhurst. Attendance at any of the Madera County schools requires the official transfer.

Wawona and Fish Camp have their own volunteer fire departments for structural fire protection. Yosemite West can be served by either the Wawona volunteer unit or by the National Park Service. Both of the federal level units, and CDF can respond to wildland fires, particularly in the summer months. CDF is the dispatch agency.

Residents can dispose of solid waste either at Park facilities or at the Fish Camp transfer station.

There are unlimited recreational opportunities in the planning area for both winter and summer activities.

7.000 COUNTY GOVERNMENT FISCAL ANALYSIS

7.100 INTRODUCTION AND SCOPE

The following sections address the issue of the financial impacts of growth and development. The first section contains an overview assessment of the County's historic revenue and expenditure patterns. Section 7.300 analyzes several basic county functions and the final section deals with fiscal impacts.

These sections are intended to provide background information and specific conclusions are subject to amendment pending the development of updated information.

7.200 COUNTY REVENUE AND APPROPRIATIONS

7.201 INTRODUCTION

As discussed in section 2.000, Mariposa County has been experiencing a major change in its growth over the past ten years and this trend is expected to continue through the year 2000. There are other changes that have taken place in the past 10 years that have had some dramatic effects on the financing of local government. The following section addresses the trends of County revenue sources and appropriations. These trends must be examined in light of the rapid growth of the County in addition to the passage of proposition 13 and proposition 4.

Although the impacts of these Constitutional amendments are not fully understood at present, an examination of budgetary trends indicates that certain shifts that were occurring in a gradual manner prior to 1978 have become more dramatic.

7.202 OBJECTIVE

The objective of this section is to identify specific trends of the financing of local government in Mariposa County and examine the implications. Revenue and appropriation trends, ultimately set the limits with respect to how, and to what degree, local government can provide services.

7.203 REVENUE ANALYSIS

For purposes of analysis, the revenue sources of Mariposa County have been compiled for the past six years (fiscal years 1974-75 to 1979-80). The revenue sources have been grouped in two major headings of tax and non-tax revenues. Table I below describes relative percentages of total revenues by major heading and sub-heading. This table indicates the major shift from tax revenues to non-tax revenues during the six year period of examination.

It should be noted that the effects of proposition 13 did not show a dramatic change in Mariposa County property tax receipts. This is due primarily to the low tax rate of the County prior to the passage of proposition 13. Exhibit I describes the relationship between tax and non-tax revenues and projects the linear trends of these revenue sources through fiscal year 1985-86. Exhibit I also compares the relative importance of property and non-property tax receipts. If these trends held true through 1985, property tax will produce less than 10% of all revenue to the County and non-property tax recepits less than 17%. This compares to 24% and 43% respectively for 1974-75.

The implications here are clear: the higher dependance on non-property tax revenues will limit the discretion that local government has over where revenues will be spent. Increased dependance on fees for services and revenues from other governmental agencies, which are highly catagorical with respect to where these revenues can be used. Local control will be minimal and Mariposa County government will have fewer options with respect to adjusting to changing circumstance or identifiable local priorities.

It is also important to keep in mind that this process will not happen automatically but rather will require specific policy enactment. Services that are subject to fees will have to be adjusted to reflect real costs and aggressive programs developed to maximize the potential of other Governmental Agency (State & Federal) Revenue Services. By the same token, public demand for services that are not amendable to fee structures such as fire protection, law enforcement, streets and roads, may be subsidized through voter approved tax overrides. Other services may be reduced or eliminated. All of these actions, however, will require a great deal of public participation and changes will require a considerable amount of time.

Inherent in the unique fiscal situation of Mariposa County is the problems of increased growth/service demand, high dependance on unstable revenue sources and lack of responsiveness of principle revenue sources to local growth or need. Prior to passage of proposition 13, Mariposa's growth rate was just beginning to be felt

TABLE I

MARIPOSA COUNTY
REVENUE BY SOURCE
ANNUAL PERCENT CHANGE

FY 1975/76 to 1979/80

	75-76	76-77	77-78	78-79	79-80
Tax Receipts:	6.13%	14.90%	17.68%	3.43%	11.64%
Property Tax related	1.91%	29.31%	16.12%	1.26%	(-3.17%)
Non-property related	8.58%	7.07%	18.72%	4.83%	20.81%
Other Revenue:	(-29.52%)	90.10%	51.48%	14.57%	20.26%
Lic. permits & franchises	193.34%	12.51%	696.27%	30.68%	10.21%
Fines, forfeitures & penalties	64.69%	8.34%	18.15%	(-2.29%)	19.99%
From use of money & property	(-.59%)	1.68%	76.60%	64.95%	171.05%
From other government agencies	(-40.26%)	116.93%	55.85%	10.25%	3.88%
Other revenue	(-19.84%)	114.99%	(-10.32%)	(-15.95%)	(-5.96%)
Charges for current services	(-1.14%)	28.81%	46.35%	14.58%	27.31%
Total Revenues	(-7.26%)	36.37%	31.14%	8.53%	15.82%

in the local tax rate in response to increased service demands. Up to 1977-78, Mariposa County had been able to accomodate the unpredictable nature of its principle revenue sources through adjustment of the property tax rate and maintenance of substantial money reserves.

This conservative fiscal policy was dealt a double blow through the passage of proposition 13 and enactment of AB 8 (the State bail-out legislation). Proposition 13 eliminated the flexability of the local tax rate and AB 8 established a formula that resulted in the major portion of the local property tax going to the school district, a result of the cash reserves holdings of the County.

Table II describes the percent increase or decrease in the various revenue sources of the County from 1975-76 through 1979-80. It should be pointed out that the largest single source of revenue to the County had been sales and bed tax receipts from the Yosemite Park and Curry Company, the National Park Service Concessionaire. These non-property tax receipts are extremely sensitive to national and international economic variations. The reliance on tourism as a principle revenue source has dramatic implications on the County's fiscal well being during difficult economic periods. This situation is also true of other state and federal revenue sources.

The overall effect of the instability of revenue sources is reflected in Table III. The budget as a percent of revenue exceeded 100% 2 out of 6 years analyzed. Table III also provides some insight into the key provisions of proposition 4. Under the provisions of proposition 4, tax receipt appropriations are limited to the 1978-79 tax receipt appropriations multiplied by a factor equal to the rate of growth plus the rate of inflation. If these factors are utilized to examine the County budget from 1975-76 to 1979-80 the following relationship:

Year	Population Growth % + (-)	CPI % + (-)	Total % + (-)	Budget % + (-)
1974-5	4.80%	8.07%	12.87%	19.8%
1975-6	6.10%	6.99%	13.09%	7.5%
1976-7	2.00%	6.11%	8.11%	23.7%
1977-8	5.90%	6.03%	11.93%	27.0%
1978-9	13.90%	8.25%	22.15%	6.1%
1979-8	7.00%	10.22%	17.22%	48.0%

Based upon the above trends, it appears that the County budget reflects growth in population and/or inflation one year following the growth. This ratcheting effect creates a cycle that on the average, over the six year period of survey, has resulted in budgetary growth that exceeded the population and CPI growth averages by 7.8%. It can be assumed that this increase could be the result of; 1) Higher service level demands, 2) High initial investments in capital facilities which are not amortized over useful life or needless expenditure of public resources. Regardless of the causes, the porvisions of proposition 4 establish an appropriation sealing on funds derived from tax sources. This constitutional amendment sets the parameters under which the budgetary process will operate in the future.

7.204 APPROPRIATION ANALYSIS

Table IV describes the relative appropriations to seven major expenditure headings. Through the six year study period, relative appropriation levels have been constant with a couple of exceptions such as streets and roads. It is assumed that these relationships will be maintained in future years.

For purposes of analyzing County appropriations two factors must be evaluated; 1) Growth of budget levels in responce to population growth and, 2) Growth of budget levels as a function of increased cost by unit of service. This latter factor has primarily been due to inflation over the past six years. It is assumed that revenues and appropriations are equally effected by these two factors however, specific County appropriation and revenue categories may not keep pace. This is specifically true of the public ways and facilities appropriation category.

TABLE II

MARIPOSA COUNTY
REVENUE BY SOURCE AS PERCENT
OF TOTAL REVENUE
FY 1974/75 to 1979/80

REVENUE SOURCE	FISCAL YEAR					
	74-75	75-76	76-77	77-78	78-79	79-80
Tax Receipts:	62.43%	71.45%	60.20%	54.02%	51.48%	49.62%
Property Tax Related	22.87%	25.14%	23.84%	21.10%	19.65%	16.45%
Non-Property Tax Related	39.56%	46.31%	36.36%	32.92%	31.83%	33.17%
Other Revenue:	37.57%	28.55%	39.80%	45.98%	48.52%	50.38%
Lic., Permits & Franchises	.13%	.41%	.34%	2.06%	2.49%	2.36%
Fines, Forfeitures & Penalties	.99%	1.74%	1.39%	1.25%	1.13%	1.17%
From Use of Money & Property	2.74%	2.94%	2.19%	2.95%	4.48%	10.50%
From Other Govt. Agencies	27.66%	17.82%	28.35%	33.69%	34.23%	30.69%
Other Revenue	4.05%	3.51%	5.53%	3.78%	4.04%	3.28%
Charges for Current Services	2.00%	2.13%	2.00%	2.25%	2.15%	2.38%
TOTAL REVENUE	$3,020,827	$2,801,502	$3,820,352	$5,009,848	$5,437,308	$6,297,710

TABLE III

MARIPOSA COUNTY BUDGET
REVENUE/EXPENDITURE SUMMARY

FY 1974/75 to 1979/80

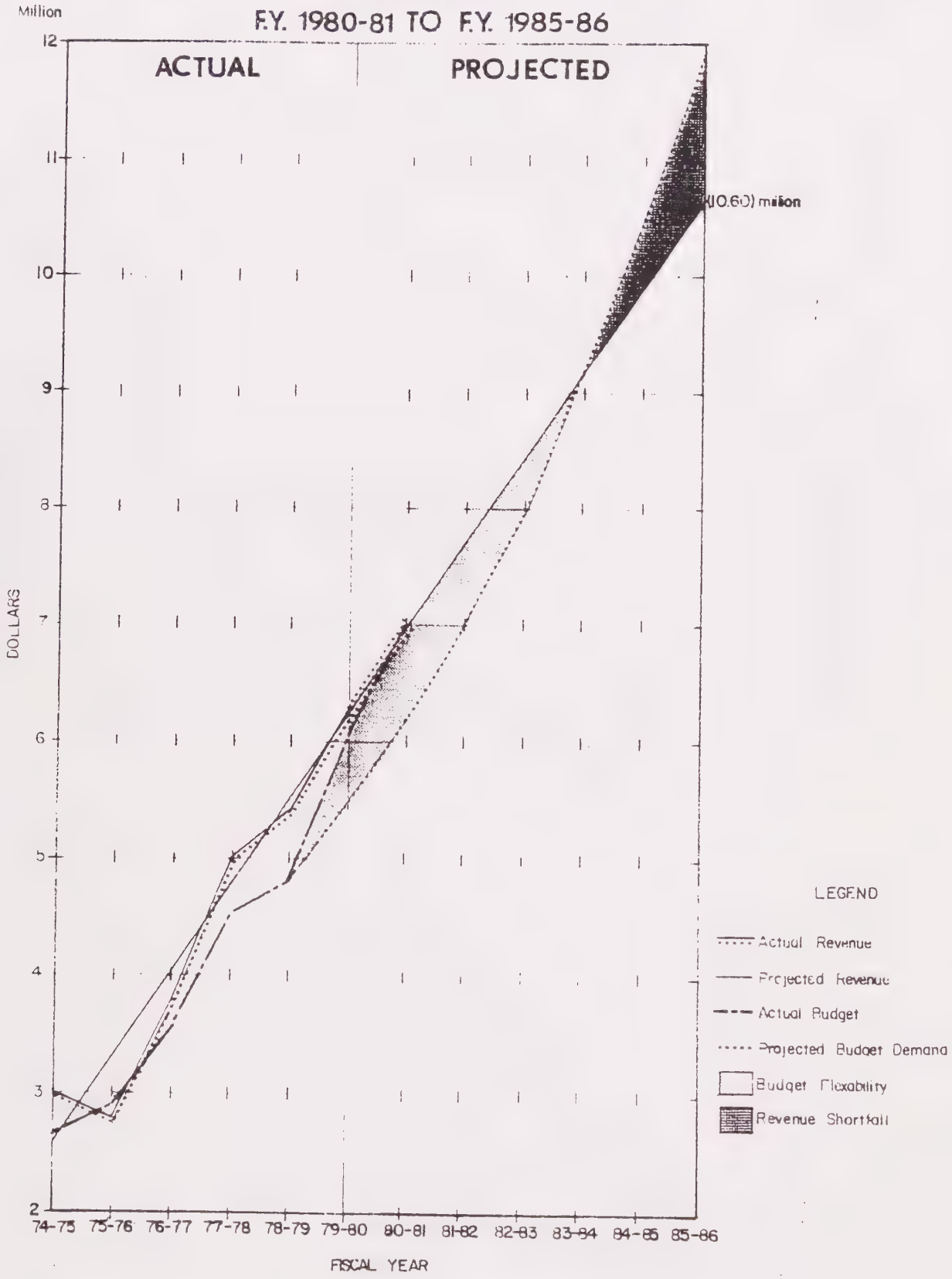
CATEGORY	FISCAL YEAR 1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
Total Revenue	$3,020,827	$2,801,502	$3,820,352	$5,009,848	$5,437,308	$6,297,710
Total Budget Expenditures	$2,669,447	$2,869,037	$3,548,778	$4,506,408	$4,779,379	$7,076,369 Es
Budget as % of Revenue	88.37%	102.41%	92.89%	89.95%	87.90%	112.36%
Total Budget Increase (%)	N/A	7.5%	23.70%	27.00%	6.1%	48.00% E
Total Revenue Increase (%)	N/A	(-7.26%)	36.37%	31.14%	8.53%	15.82%
Total Pop. Increase (%)	N/A	6.10%	2.00%	5.90%	13.90%	7.00%

EXHIBIT II

MARIPOSA COUNTY

REVENUE VS BUDGET DEMAND PROJECTION

F.Y. 1980-81 TO F.Y. 1985-86



Due to the nature of revenue sources supporting street and road budgets, County revenues for this activity do not grow in proportion to population growth and inflation. This has resulted in the relative decline in appropriation for this activity from 39.73% of the 1974-75 fiscal year to a little over 23% of the 1979-80 budget total. The lack of responsiveness of street and road revenues to growth needs have major implications in the future. Unless the allocation formulas of State and federal road funds are revised, road construction and maintenance will continue to represent a smaller proportion of all County revenues and appropriations will not match the increased need.

TABLE IV

MARIPOSA COUNTY
APPROPIRATIONS BY BUDGET HEADING
AS PERCENT OF TOTAL BUDGET

FY 1974-75 TO 1979-80

BUDGET CATEGORY	74-75	75-76	76-77	77-78	78-79	Projected 79-80
General Government	21.13%	23.23%	28.96%	23.00%	25.73%	24.66%
Legislative & Administrative	2.23%	3.62%	3.54%	3.03%	3.55%	2.78%
Finance	5.58%	5.93%	5.39%	5.25%	5.23%	4.66%
Council	1.04%	1.04%	1.20%	1.08%	1.16%	1.06%
Elections	.64%	.82%	.94%	.50%	1.12%	.87%
Property Management	2.96%	2.41%	2.33%	2.22%	1.67%	1.42%
Plant Aquisition	.31%	.61%	6.43%	.80%	3.16%	3.53%
Promotion	.29%	.38%	.33%	.28%	.22%	.12%
Other General	7.11%	8.42%	8.90%	9.84%	9.62%	10.22%
Public Protection	15.96%	12.04%	19.54%	21.76%	22.13%	21.00%
Public Ways & Facilities	39.73%	32.06%	26.66%	30.60%	26.72%	23.34%
Health & Sanitation	3.75%	5.42%	5.70%	5.54%	7.28%	7.36%
Public Assistance	14.91%	15.11%	14.64%	14.67%	15.09%	13.57%
Education	1.91%	1.97%	1.76%	1.66%	1.58%	1.21%
Recreation & Culture	2.59%	2.64%	2.74%	2.77%	2.71%	2.58%
Contingency	.02%	7.53%	0%	0%	0%	6.28%
TOTAL BUDGET	$2,668,547	$2,653,036	$3,548,778	$4,506,408	$4,779,379	$7,076,369

7.205 CONCLUSIONS

The reduced revenue generating ability of the County, in combination with increasing demand for services, will ultimately translate into a reduction of certain County activities. Exhibit II projects the revenue available to the County and the projected service demands based on proposition 4 budget constraints. Based on this information, it is estimated that two things are likely to happen in the not too distant future:

1. It appears unlikely that the County will ever exceed its appropriation limitation established by proposition 4.

2. That the County will begin to feel the effects of proposition 13 and AB 8 sometime after 1983-84 when revenues will not meet basic service demands.

After fiscal year 1983-84, it appears likely that the County will face the alternative of eliminating or substantially cutting some basic activities or developing new revenue sources. The cut-backs, if implemented, will be in areas of non-mandated services in all likelihood.

It would appear that even with new revenue sources developed, basic services will need to be paired back in future years and major changes in policy regarding the types of services the County provides will need to take place. The following sections of this report address the subjects of basic services and growth in various areas of the County.

7.300 BASIC SERVICE ANALYSIS

7.301 PREFACE

The preceeding sections have addressed the subjects of population growth and County budgeting policies. As the County is responsible for providing and administering numerous activities and is expected to provide a number of "Public Services", attention must be given to the operation, management, cost and availability of financing some basic service categories.

Five basic service categories have been addressed in this section; Solid Waste, Law Enforcement, Fire Protection, Recreation and Streets and Roads. Additionally, although not the direct responsibility of the County, schools have been addressed in this report.

7.302 SCHOOLS

A. INTRODUCTION

Mariposa County is served by a unified school district encompassing nine elementary schools, one high school and one continuation high school. The elementary schools are well dispersed and community-based south of the Merced River. The area north of the river is presently served by one elementary school.

The County's high school and continuation high school are located in the Town of Mariposa, necessitating extensive bussing of high school age students from all areas of the County.

Mariposa County's rapid population growth over the last five years, averaging 7% per year, and its projected growth over the next ten to twenty years has particular implications for County schools.

Demographic characteristics of the County's populace has changed, as Mariposa was once considered to be a retirement-oriented community in respect to inmigrating population. The last few years, however, have seen a reasonably larger influx of younger families with school age or preschool age children.

B. CONCERNS

Of primary concern is the future ability of M.U.S.D. to financially provide for capital facilities which will keep pace with expanding student enrollments. This concern about providing facilities, however, extends beyond the basic classroom facilities to the growing need for support facilities such as multi-purpose rooms, libraries, lunch rooms, gymnasiums and locker rooms, as well as maintenance facilities for schools and vehicles.

As current school sites reach capacity for building expansion, new sites will have to be acquired. As previously undeveloped areas of the County begin to build out (i.e. Lake Don Pedro), sites and facilities will be required.

During the past two years several pieces of legislation have affected school funding dramatically: Proposition 13, AB 8, and possibly Proposition 4. The following quickly summarizes the effects of such legislation on Mariposa County schools.

Proposition 13

The Jarvis-Gann Initiative substantially reduced County property tax revenues and set a ceiling on the property tax levy at 1% of base year values, allowing only for reassessments upon transfer of title, or for a set small annual increase in assessed value.

The dollar effect on property taxes in Mariposa County reduced property taxes from approximately $3,698,152 in 1977-78 to approximately $2,935,148 in 1978-79, a reduction of $763,000 or 21%.

The school district received $1,962,141 from property tax in 1977-78 or 49% of its budget requirements. In 1978-79 the school district's share of property tax was $1,678,060 or 36% of budget requirements.

Bail-out funds from State surpluses were allocated in the first year following Proposition 13 to supplement this deficit.

Proposition 13 also eliminated the option of holding local elections to approve School Bond issues for providing new facilities.

AB 8

The purpose of AB 8, signed into law in July, 1979, was to provide a stable financial base for schools and local governments whose main revenue source, property tax, had been decreased substantially by Proposition 13.

The effect was to redistribute a portion of the school's share of property tax to cities, counties, and special districts, thus making the State responsible for certain costs on a permanent basis. In 1979-80, K-12 school districts received on an average 8.6% more than in 1978-79. Mariposa received slightly more than the average due to high transportation costs. The school district is estimated to receive $1,473,390 in property taxes in 1979-80 or 26.8% of budget requirements.

The formula for calculating revenue for future years is complex, but essentially the long-term as well as short-term effect is to eliminate the value to school districts of increasing assessed valuations. Rather than using a specified percentage increase, starting with fiscal year 1980-81, inflation adjustments will be a flat dollar amount of $85-175 per average daily attendance (ADA) depending upon the district's 1979-80 base revenue limit and ADA.

In past years it was assumed that school revenues would increase commensurately with growing property values, hence increased property taxes. It must be understood when evaluating the impact of new development that future property values no longer relate to school revenue.

C. METHODOLOGY

The following factors have been thoroughly analyzed to determine the effect of population growth on Mariposa County Schools, and the school district's ability to provide facilities to meet the demands of student enrollment:

1. Mariposa County Schools Facilities Master Plan, adopted February 21, 1978.
2. Enrollment growth for the last two years, plus projected enrollment in ten and twenty years by school vs. capacity.
3. Inmigration of new students as a percent of enrollment increase.
4. Complete current facilities inventory.
5. Analysis of a year-long new property owners survey indicating family size and number of school age children.
6. Comparison on land division activity against number of building permits issued.
7. Profile of unimproved vs. improved lots.
8. Population growth projections for 10 to 20 years.
9. Effects of recent tax legislation on school's funding and facilities financing.

D. INVENTORY

CHART I

MARIPOSA UNIFIED SCHOOL DISTRICT
ENROLLMENT VS. CAPACITY

Schools	1979 Enrollment	1979 Capacity	1980 Enrollment	1981 Enrollment	1981 Capacity	1989 Enrollment
Elementary						
Catheys Valley	43	50	47	46	50	50
Coulterville - Greeley Hill	140	150	155	165	175[1]	230
El Portal	76	100	78	81	100	75
Hornitos	15	20	17	17	20	20
M. Elem-1-6* (Inc. spec. ed)	305	325 (350)**	300	311	325 (350)**	370

CHART I (cont.)

Schools	1979 Enrollment	1979 Capacity	1980 Enrollment	1981 Enrollment	1981 Capacity	1989 Enrollment
Elementary (cont.)						
M. Jr. High Sch.	252	250	250	239	275[2]	375
Wawona	19	20	17	19	20	20
Woodland	266	275 (300)**	287	310	300 (325)**[3]	460
Yosemite	73	125	70	69	125	75
Total Elementary	1189	1315	1231	1238	1390	1675
Mariposa High Sch. s/special ed.	602	625	613	650	690[4]	875
Spring Hill	67	n/a	75	80	n/a	150
Total High School	669	625+	688	730	690+	1025
Total School System	1858	1940	1919	1987	2080	2700

* Enrollment figures include spec. ed. - capacity does not
** Number in parentheses indicate running 2 k-classes, morn. & aft. sessions
1, 2, 3, 4 Indicates increased capacities from 2 yr. bldg. program

CHART II

MARIPOSA UNIFIED SCHOOL DISTRICT
GROWTH PROFILE

Schools	Total % Change 68-79	Aver. Ann & CH 68-79	%Change 78-79	Change in #'s 78-79	Net out-of-Co. Trans. 79	Net. out-of-Co. Tran.% of Change-79
Elementary						
Catheys Valley	+ 19.4%	+ 2.7%	+10.2%	+ 4	+ 4	100 %
Coulterville - Greeley Hill	+211.1%	+11.6%	+12.9%	+16	+15	93.8%
El Portal	- 11.6%	+ .5%	- 9.5%	- 8	- 6	75.0%
Hornitos	- 16.7%	- 1.0%	+ 7.1%	+ 1	+ 2	200.0%
M. Elem. - K-6 (inc. spec. ed)	+ 9.3%	+ 1.1%	- 9.5%*	-32*	+ 3	n/a
M. Jr. High Sch.	+132.1%	+ 8.0%	+ 9.1%	+20	+17	85.0%
Wawona	+ 5.5%	+ .7%	+46.0%	+ 6	+ 3	50.0%
Woodland	+154.8%	+ 9.4%	+12.2%	+29*	+ 9	31.0%
Yosemite	- 25.5%	- 2.1%	+ 2.8%	+ 2	+ 5	250.0%
Total Elem. Sys.	+ 49.7%	+ 3.8%	+ 3.6%	+38	+52	136.8%
Mariposa High Sch. (Inc. Springhill)	+ 73.8%	+ 5.3%	+ 4.5%	+29	+ 4	13.8%
Total Sch. Sys.	+ 49.7%	+ 3.8%	+ 3.5%	+67	+56	83.6%

* Figures adjusted for transfer of K-class from Mariposa Elementary to Woodland in November of '78

CHART III

FACILITIES INVENTORY

(September, 1980)

Mariposa County High School	-15 Classrooms -1 Special Education Room -1 Industrial Arts Facility -2 Science Rooms -2 Home Ec Rooms -2 Business Ed Rooms -1 Arts & Crafts Room -1 Ag Facility -1 Gymnasium; showers and lockers -1 Auditorium -1 Library -Offices and Staff Workrooms; Kitchen
Mariposa Junior High School	-10 Classrooms -1 Special Education Room -Offices and Staff Workroom
Mariposa Elementary School	-1 Kindergarten Room -12 Classrooms -3 Special Education Rooms -1 Staff Workroom -1 Library -Offices
Woodland	-1 Kindergarten Room -11 Classrooms -1 Special Education Room -1 Staff Workroom; Office
Coulterville-Greeley	-7 Classrooms -1 Staff workroom; Office; Kitchen
Yosemite	-1 Kindergarten Room -3 Classrooms -1 Library -1 Auditorium -Kitchen; Office
El Portal	-4 Classrooms -1 Auditorium -1 Staff workroom; Office
Catheys Valley	-2 Classrooms -1 Library -1 Staff workrpom; Office
Hornitos	-1 Classroom -1 Office
Wawona	-1 Classroom -1 Office

CHART IV

LAND DIVISION ACTIVITY

January 1, 1979 to Dec. 31, 1979

MINOR LAND DIVISIONS

Projects Approved	New Lots Created
81	156

MAJOR LAND DIVISIONS

Projects Approved	New Lots Created
6	122

TOTAL NEW PARCELS CREATED

Minor Land Divisions		Major Land Divisions		TOTAL To Date
156	+	122	=	278

CHART V

PROPERTY OWNERS SURVEYS

April 1979 - March 1980

772 Responses
1,607 Property Transfer

228 Total Families indicate a move within 5 years
111 Families with School age Children

148 School Children

Area	Families with School Age Children	School Age Children	High School	Preschool
Coulterville/ Greeley Hill	14	21	9	2
Lake Don Pedro	32	28	12	37
	46	59	20	39
El Portal	9	15	1	6
Hornitos	2	1		1
Mariposa Elementary School	18	26	15	9
Yosemite/Wawona	1	2	1	
Catheys Valley	2	3	2	2
Woodland	33	42	18	23
TOTAL	111	148	58	80

E. GROWTH IMPACT ON FACILITIES

A review of student enrollment growth of Mariposa schools in Fall, 1979, as contained in Chart II, indicated that 136.8% of the numerical growth in elementary schools was the result of in-migration of new families over the summer months. The conclusion is that were it not for families moving into the County, Mariposa schools would be experiencing decreasing enrollment.

During 1979, 81 minor land division projects created 156 new lots and 6 major subdivisions created 122 new lots, totaling 278 new lots. Building permits for new dwellings (including MH) issued in 1979 totaled 295, indicating that unimproved lots are being retired at a rate greater than they are being created.

A property owner survey form, in use since early 1979, acts as an indicator of the changing demography of the County. This form attempts to determine the number of investors, retirement buyers, and the number of families with school age children who intend to live and educate their children in Mariposa County.

A synopsis of information submitted in the responses are contained in Chart III. The response rate (772) to date is 48% of all property transfers (1,607). The chart examines information relating to children in families intending to relocate within the five-year period up to 1985. Of all families intending to locate within this time frame, the ratio of students to families is .64:1. The County-wide average was .47:1 as of September, 1979.

Because the five-year period to 1985 would conceivably graduate all the high school students listed in the responses, a comparison was made of high school age vs. pre-school age children. Assumably preschool age children would have entered the system by this time. In the responses included in this analysis, there were 80 preschool children vs. 58 high school students.

This would seem to substantiate the perception that there is a larger influx today of younger families who will be placing increased demands on the County's schools.

The elementary schools most effected by the responses in order of impact are as follows:

- Coulterville - Greeley Hill (38 Students includes 26 in LDP areas)
- Woodland (24)
- Mariposa Elementary (11)
- El Portal/Yosemite (14)

In terms of preschool youngsters the schools effected by responses in order of impact are:

- Coulterville - Greeley Hill (39 includes 37 in LDP)
- Woodland (23)
- MES (9)
- El Portal/Yosemite (6)

A review of unimproved vs. improved lots in the county must rely upon 1979 base data to determine potential impact of existing lots upon schools. As of March 1, 1979, there were 9,608 parcels with 5,429 unimproved. In school areas experiencing the greatest enrollment growth pressure as shown in Chart I, there are large numbers of unimproved lots as follows:

- Coulterville - Greeley Hill 2,334 (1,701 are in the LDP area)
- Mariposa Elementary 1,110
- Woodland 1,064

Assessors Parcel Book No. 15, all of which are in the Woodland School Area, indicates 702 unimproved lots as of 3-1-79. For the three-year period ending December 1979, 24% of all building permits have been issued within this APN boundary. 21% of building permits in the same time period were within the areas of Coulterville - Greeley Hill School.

An historical review of student enrollment as a percent of the total population was completed to determine the potential long term effect of population growth on school facilities.

Year of Census	K-12 Enrollment	Population	Percent
1970	1,253	6,015	20%
1975	1,598	8,441	19%
1979-80	1,858	10,650	17%

This statistical picture would tend to discredit the assumption that demographic characteristics are changing to younger families. More realistically, however, the 1970's witnessed a marked decline in family size, combined with a period of retirement oriented growth in Mariposa. The 1980's will quite likely see the picture stabilize as families with school and preschool age children constitute a larger share of new households, as indicated by the new property owner survey.

Determining intermediate and long term growth impacts on County school enrollment is necessarily complex given the following factors:

1. K-12 population as a percent of total population has been based on State Department of Finance population projections, which are believed to be considerably lower than actual population. If this is true the student percent of population would decrease.

2. Uncertain annual growth rates in future years.

An update on current County population levels should be available from the 1980 census. Additonally, data are being generated which will project maximum and minimum population capacities for the County for 19 planning areas, based on current land use policies.

In lieu of availability of these more concrete data, the following projections have been made as a means of dramatizing the potential school enrollment increase to the year 2,000!

Should current population as reported in the 1980 census be higher than present Department of Finance Projections, the percent of students to total population would be less than the percentages used in this projection.

COMPARATIVE POPULATION STUDY

	1985	2000
Estimated Population	15,767	20,305
School Population (17.9%)	2,822	5,246
School Population (17%)	2,680	4,982
School Population (15%)	2,365	4,396
Range	2,365-2,822	4,396-5,246

Method

1. Cohort Survival	2,212	-
2. 75/yr. Average	2,308	3,433
3. 90/yr. Average	2,398	3,748
4. 4.63% Cummulative	2,438	4,594
5. 5.00% Cummulative	2,490	5,176
Range	2,212-2,490	3,433-5,176

Notes:

1. Cohort Survival is based on moving classes and percentage growth. Good for short-range forecasts only.

2. 11 Year average = 62/yr. or 4.20% cummulative
   5 year average = 71/yr. or 4.30% cummulative
   3 year average = 87/yr. or 5.00% cummulative

3. Method 4 (4.63% cummulative) based on weighted average of three averages.

In order to keep abreast of this increasing enrollment, the following new school sites and facilities would be required in addition to increasing existing school capacities as area population growth demands.

1. Junior High School Site in order for MCHS to expand into existing MES 7-8 facilities.

2. Woodland/Mariposa Area Elementary School.

3. Bridgeport Elementary School.

4. Enlargement of Woodland Site.

5. Lake Don Pedro Elementary School.

6. Acquisition of parcels at corner of Jones and 8th.

7. Additional High School Site.

Based upon an intermediate and long-range financial picture for funding of construction projects for support facilities, beyond basic classroom requirements, policies can be adopted which would define an acceptable level of educational support services.

7.303 SOLID WASTE MANAGEMENT

A. INTRODUCTION

Solid waste is deposited at the solid waste disposal site, which is located approximately three miles north of the Town of Mariposa on Highway 49 N. Domestic use is primarily by private vehicle; however, the County of Mariposa has issued Certificates of Public Convenience and Necessity to four collecting contractors. Two of these contracters are in the area South of the River, one is in the northside of the County (which is not currently in operation), and the other is located in Fish Camp, in the extreme eastern part of the County. In addition, the National Park Service uses the County facility to dispose of solid wastes from Yosemite National Park, including private waste pickup from Yosemite West, El Portal, and Foresta.

The current disposal site is estimated to be useful for the next seven years. At that time, the County will have to utilize another facility; funds are currently being budgeted for land acquisition purposes to meet that future need.

B. CONCERNS

The primary concern affecting solid waste disposal in the County is that a new site will have to be acquired and put into service within the next seven to ten years. This constitutes a complex selection process, since a solid waste disposal site must have a soil depth which provides adequate fill; must be without steep slopes, preferably with undulating topography; must be accessable to the public; must be away from developed areas; and must be able to be reclaimed for a higher use after it has reached capacity.

There are three transfer stations currently in use; these are located in Coulterville, Hornitos, and Fish Camp. The Fish Camp facility is currently being reconstructed to meet State guidelines. The adequacy of these facilities is addressed in Section E, Fiscal Evaluation.

In the planning process, operational arrangements must be taken into consideration. Before the current disposal site is fully utilized, the County must decide whether to purchase land for a future disposal site or make lease arrangements. Further, a decision must be made as to whether the County itself should operate the site or if it should be contracted out. The main concern here is to fully study the situation to see what option would be the most cost effective to the County and to the users of the facility.

The last major concern is identifying and implementing the best way of financing the solid waste disposal program. A variety of revenue sources are available, primarily utilizing user fees.

C. METHODOLOGY

A thorough examination has been made of the following factors affecting solid waste management:

1. Population projections to the year 2010.
2. Amount of refuse generated per capita per year in the County.
3. Adequacy of the current disposal site and its projected life.
4. Adequacy of the refuse transfer stations in the County.
5. Alternative collection methods.
6. Alternative solid waste management systems.
7. Costs of facilities, land acquisition, maintenance, and equipment.
8. An assessment of future needs, including sites, transfer facilities and equipment.

Policies presented in Section F of this document reflect these analyzed factors, along with the fiscal impacts discussed in Section E.

D. INVENTORY

SOLID WASTE SITE

The solid waste site in current use is 47 acres located on the west side of Highway 49, approximately 3 1/2 miles north of the Town of Mariposa. Life expectancy of this site is seven to ten years.

There is a 160 acre site secured for future use at Lake Don Pedro which can be developed as necessary for that subdivision only, as provided in the deed.

TRANSFER STATIONS

Location	Capacity	Distance From Site
Coulterville	70 cu. yd.	26 miles
Hornitos	50 cu. yd.	22 miles
Fish Camp	70 cu. yd.	51 miles

There is also a 16 cu. yd. transfer facility at Lake Don Pedro which currently serves only the needs of the residents of that subdivision.

EQUIPMENT

D-8 Caterpillar Dozer
D-8 Caterpillar Dirt Mover
14-A and Scraper (budgeted in FY 1979-80)
320 International Deisel - 75 yd. Compacter
Two Pick-up Trucks

HOURS OF OPERATION

7 days per week; 11 hours per day.

PERSONNEL

Portion of Special District Manager's Time
Heavy equipment mechanic/operator
Equipment operator
Maintenance Worker II/Truck Driver
Attendant - Contractual
CETA Relief Attendant

CERTIFICATES OF CONVENIENCE AND PUBLIC NECESSITY

Kenneth Cooke dba Cooke Disposal Service, Refuse Collection Service
Clinton Schutt, septic tank cleaning and pumping
Henry L. Tunequist dba Wawona Disposal, transfer station pick-up and refuse collection service
Andre Wright and Frank Chruch dba Mother Lode Scavenger Company, refuse collection service

INCOME

The Yosemite National Park Service has paid Mariposa County an average of $5.00 per ton for solid waste disposal from park areas. The Park has also provided a service to the County by hauling waste from private lands in El Portal, Foresta, and Yosemite West. The amount paid by NPS has varied from $16,695 to $21,057 over the last four years.

E. FISCAL EVALUATION

COSTS OF OPERATION AND USER FEES

Actual expenditures for the management of solid waste in 1975-76 was $[illegible],596, or $5.52 per capita. The budget for solid waste management in 1979-80 is $117,537, or

$10.31 per capita. A portion of this increase in costs is a one time expenditure for a 14A and Scraper of $14,000; recurring costs are the depreciation fund for equipment of $18,720, and an appropriation for the land acquisition fund of $15,000, appropriations which occurred for the first time in 1979-80.

To put this budget into perspective with other County costs for services, the FY 1979-80 budget for solid waste management is almost double the appropriation for fire protection, and more than 1/4 of the Sheriff-Coroner's Office budget.

Because of these rapidly increasing costs for solid waste, it is necessary to look carefully at a means by which the Cost to the County government can be transferred to users of solid waste disposal facilities.

In reality, the budget and actual expenditure sums for solid waste management are not paid completely by local government at present, as an average annual fee of $18,657 has been paid by the National Park Service over the last four years. In 1977-78, the first year for which such records are available, this amounted to 41% of the year's costs, and in the current budget year, it can be assumed that the amount will be 16% of total costs.

The current year's budget required analysis as to the percentage of cost directly related to operation of transfer facilities and transportation costs associated with transfer of solid waste; this was done in order to put the user fees paid by the National Park Service into an accurate perspective.

Transfer costs in the current budget total $28,736, reducing the $117,537 budget to $88,801. NPS average fees are 21% of this amount. The average tonnage over the last four years is 3,706 tons, or 37% of the County-wide projected tonnage for 1980.

The fees charged the NPS have not been reevaluated within the last year in light of cost increases during the last two years, although the method of billing the Service has been renogotiated from a flat fee per ton to a fee based on truck size and the number of deliveries to the solid waste site. A review of billing and tonnage reported for 1979 indicates that the NPS paid approximately $5.16 per ton based on the new billing arrangement. It is reasonable to assume that NPS user fees should have some relationship to fees paid by County residents, less an allowance for services provided to the County. In the user fee study conducted by the County during 1979, the minimum cost per ton per resident would be $9.42 per ton as compared to the NPS fee of approximately $5.00 per ton. Using these figures, the total user fees collected would not be sufficient to meet the annual costs of the solid waste disposal operation.

An actual analysis of the FY 1979-80 County budget for solid waste management indicates the following:

Solid Waste Management Budget:	$117,537	
National Park Service Average User Fees:	18,657	(average 3706 tons)
Paid by County Government:	$ 98,880	

County resident usage is projected to contribute 6,242 tons within this same fiscal year at a cost of $15.84 per ton to County government.

It would be desirable to have the entire cost of the solid waste operation covered by fees. To determine an equitable allocation of fees to both residents and the NPS, the formula is somewhat complex, since the NPS should not be expected to subsidize the transfer operations which solely benefit residents outside of the park. It would be reasonable to expect that Park Service fees would contribute to depreciation of equipment, acquisition of equipment required at the solid waste site, and acquisition funds for a new disposal site. Also the NPS does provide a direct service to the County by transferring waste from private users adjacent to the Park. This is estimated in the current year to be approximately 300 tons, or 8.1% of the Park's average annual tonnage.

The following formula is submitted as a suggestion on how such distribution of fees could be done equitably:

1. Budget minus transfer operations divided by Total County-wide Tonnage = Cost per Ton X (Tons delivered by Park Service - 300 tons from private sources) = Annual Cost to Park

2. Budget minus annual cost to Park = Amount allocated to residential users (to be paid either by County government or through user fees

If the 1979-80 budget were used as the base year for determining an equitable fee structure, the following fees would result:

Cost to Yosemite National Park

1. $117,537 - $28,736 = $88,801
   divided by 9948 tons = $8.92 per ton
   X (3706 minus 300) = $30,381.52 Annual Cost to Park

Cost to Residents

2. $117,537 - $30,382 = $87,155

On a per ton basis, this would amount to $13.96 in costs to residents through user fees or direct cost to County government. Restructuring the fee allocations would result in a cost increase to the Park Service of 63%, and a decrease to the County and/or residents of 12%.

Using 1979-80 as the base year for calculating fees, hopefully population growth over subsequent years would account for the necessary funds required to keep pace with increased costs, whereas NPS costs would remain static in the future. These static costs for the NPS assume that the Park has been used to capacity for several years, and no more facilities will be provided. Park Service programs to recycle may actually result in a reduction in tonnage over the next few years in spite of visitor usage levels.

The methodology for distributing the user fees by land type, and the system for collecting this financial resource must be carefully considered and resolved by the County with an emphasis on equitability, as well as on recent State taxation legislation. It is important here to note that, under Prop. 4, any collection of user fees would reduce the County's appropriation limit for the solid waste disposal program, and would not result in a savings that could be reallocated to other County departments.

FUTURE SOLID WASTE DISPOSAL SITE

An analysis of the projected residential growth of the County has been completed; this analysis indicates a life expectancy for the current solid waste disposal site of a minimum of seven years. The same methodology* was utilized to determine the size requirement for a new site. The actual fill area required in a site is considerably less than the acreage requirement for the total site. Because of setback guidelines and the requirement for sufficient soil required for fill and cover, the site requirements would be as follows:

	63 acres:	setback and soil resource
+	15 acres:	site fill depth of 50'
or, +	19 acres:	site fill depth of 40'
or, +	26 acres:	site fill depth of 30'
or, +	32 acres:	site fill depth of 25'
or, +	39 acres:	site fill depth of 20'

Depending upon topography and fill material, site acreage requirements are a minimum of 80 acres to a maximum of 110 acres in order to provide a site which would serve the County for at least 20 years. This site acreage estimate is based on the best information available at this time on population projections to the year 2010.

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*Projected population each year X 3.0 lbs. per capita solid waste per day = tons per year X 2.5 (cubic yards/ton) = County generated cu. yds./year + NPS cu. yds./year = Total cubic yards per year divided by 1290.7 (cu. yds. waste when added to dirt which will fill one foot deep in one acre divided by the anticipated depth of site = acres required per year)

Estimates of costs to provide a 110 acre site were based on the purchase of a site, and on the possibility of leasing a site. This information on land values was provided by the County Assessor's Office.

Assuming a cost to purchase a site of 110 acres at $1,000/acre, the initial cost impact would be $110,000. The value per acre is based upon obtaining a site which is unsuitable for development. Depending on interest markets at the time of purchase, a cash purchase might compare favorably to a down payment and amortized loan arrangement, given the investment constraints on County reserves. A benefit of direct purchase over the lease arrangement is in-direct cash reserves for the County resulting from property value increases in the 20-year period. Assuming property value increases of only 5% per year, the property could return a minimum of approximately $292,000 to the County when the land is reclaimed. Current State analysts interpretation of Prop. 4 indicates such monies may be exempt from the rule on proceeds from investment of revenues.

It is realistic to assume that the County would have the financial ability to make such a purchase. The County's current disposal site should have no less value per acre than a new site when it is reclaimed. At $1,000/acre for the 47-acre site, the land could generate $47,000 when it is reclaimed and sold. During FY 1979-80, another $15,000 was set aside in a site acquisition fund. This leaves approximately $48,000 to be appropriated over the next seven to ten years. An overriding benefit of this methodology effectively reduces the budget requirements for this County service, and thereby reduces user fees. Instead of appropriating $15,000 per year for the site acquisition fund, $7,000 per year could be appropriated. With interest gained on this appropriation, the fund alone would be worth $74,311 at 6% interest, plus the sale value of the current site.

If a lease arrangement could be consummated with a private property owner, a 20-year lease could cost the following, assuming a lease of $15 per acre per year, with a renogotiated lease clause every five years of 5% increases:

First five years:	$ 8,250
Second five years:	10,527
Third five years:	13,436
Fourth five years:	17,148
TOTAL 20-year cost:	$49,361

The costs shown above require a considerably smaller outlay of County funds annually. Should the Board of Supervisors opt for this alternative, appropriation of site acquisition funds would be unnecessary.

Therefore, the total cost outlay of a lease is less than a cash purchase of a site and would be considerably lower than an amortized loan purchase after paying interest. Given property value increases of only 5% as used in the purchase analysis, and assuming the County could have reserve funds earning interest, the lease arrangement would appear to be the most advantageous. Based on the constraints of Proposition 4 regarding maintaining reserves, however, purchasing a site that has even minimal potential for appreciation appears to be the most cost-effective alternative for the County.

It is reasonable to assume that neither alternative would be affected by the costs of restoring the site to a usable surface, as this would be required whether the County planned to sell or was reclaiming a site for use by the owner.

Another potential resource for a site which should be explored in addition to private lands, is the potential land available on State or federal lands. However, whether private or public lands are utilized, the potential site must meet the tests of size; soil depth for fill and cover material; lack of rock outcrops; configuration of the site which provides the maximum fill site area while adhering to a 400' setback rule; central location to population centers; accessibility to the public; yet separation from development.

TRANSFER FACILITIES

The current transfer facilities and their capacities are listed in Section D, Inventory, of this document. The following discussion will examine the adequacies or deficiencies of each facility.

COULTERVILLE

This facility is sufficient at present to serve the needs of this area of the County. Based on information provided by the County Special Districts Manager, the volume of waste generated on the northside of the County would have to triple before it would be cost effective to provide a solid waste disposal site other than a transfer station.

Population projections were used to determine when and if such a site would be required. It appears that a site would be required within 20 years if the Northside shows population increases of 6% per year. At a growth rate of 4% per year, a site would not be required for 30 years. (Lake Don Pedro's population was not included in these projections, since they are presently and will be in the future served separately. However, these population projections for the Northside should be re-evaluated within 5 years.)

FISH CAMP AND HORNITOS

These sites are sufficient to meet the needs of area residents now and in the forseeable future, based on current utilization and population projections.

FUTURE TRANSFER FACILITIES

The Bootjack/Darrah Road/Triangle Road area has experiencied perhaps the greatest population growth in the County in recent years, although it would not be cost effective at the immediate time to provide a transfer facility in this area because of its proximity to the present disposal site, one may be required in the near future based on population growth of the area.

There is no actual transfer facility now in Cathey's Valley. However, there is a 16 cu. yd. bin at the park site which is picked up by the County solid waste truck, and some residents do use this bin for residential waste. Because of the proximity of the current solid waste disposal site to Cathey's Valley, most residents would not utilize a transfer facility at the present time. Should a new solid waste site be selected which would be a much greater distance for residents of this area, or should this area experience considerable population growth, however, a facility would be required. Based on the population for the area, a 70 cu. yd. facility would be the minimum capacity required by 1985.

The El Portal area will continue to be served by the NPS, as the Yosemite Park Master Plan calls for construction of a transfer facility which will serve both the private community as well as the Park Service. Such a facility is anticipated for construction within five years.

Should further energy usage constraints be placed on individual travel, the question of the need for small capacity transfer facilities strategically located throughout the County may need re-evaluation. Even without the anticipated energy usage constraints, some standard of transfer service should be identified and implemented. This standard could relate to the population of an area, the square miles of a service area, or the distance traveled by individuals to the dump site.

EQUIPMENT

In addition to the equipment listed in the inventory section, there is a current need for one smaller 18 yd. compacter vehicle. The cost is $65,000. Hopefully, a used vehicle can be otained at a cost of $20,000. It would be desirable to have this in operation by 1981.

In the 1979-80 budget, a depreciation fund for heavy equipment and the diesel truck was established for the first time. The depreciation charge is based on operating hours at $13.00 per hour; therefore the current budget item amounts to $18,720. Assuming this

fund has a static annual deposit of that amount invested at 5% over five years, it would total $247,231. To put this fund into budgetary perspective, the cost of replacing one D-8 Catepillar with new equipment in today's dollars is $111,000. The equipment presently in use is excessively old, and all peices have indeterminate remaining life spans.

It may be necessary to take a hard look at the depreciation allocation and ways to maximize the benefits of such a fund. It is entirely possible that separate schedules should be established for each vehicle based on an expected life and required replacement. In all likelihood, based on the delay in establishing such a depreciation fund, the replacement equipment would have to be used rather than new, should the County retain responsibility for the solid waste operation.

The two pick-up trucks currently in operation are actually owned by Civil Defense and have in excess of 200,000 miles on them. These are service vehicles used in the litter control program and for other service purposes. It is currently planned to replace one pick-up with a newer used vehicle in the 1980-81 budget year, whereupon one would be returned to Civil Defense. The other older one would then be retired to off-road use only.

ALTERNATIVE APPROACHES TO COUNTY OPERATIONS

It may prove to be cost effective to contract many of the County's current functions in solid waste management to private contractors in the future, particularly in view of the difficulties surrounding the issue of County-collected user fees. However, such a decision by the County would require a corresponding reduction in the appropriations limit under Prop. 4.

Some alternatives to the present system are as follows:

1. Encourage licensing of private collectors on a competitive basis throughout the County, thus reducing impacts on the transfer facilities and on individual travel to the site.

2. Consider contracting the total operation to a private contractor who would be responsible to the County. Although this method could effectively remove much cost and responsibility from County government, costs could in fact be increased to individuals, as any contractor would of necessity have built in profit margins. A private operator would also receive tax benefits which do not accrue to the County, which could help balance the cost of operation.

3. Explore a possible joint powers agreement with a neighboring County. If it is not deemed feasible to develop private contracts for operation, such joint powers possibilities should be thoroughly investigated before any new site is placed into operation.

Any decision to implement any one of these alternatives should be weighed carefully as to costs and benefits to residents of the County. Limitations on such alternatives may be the difficulty in attracting contractors until waste generation, due to population center levels or County wide population growth, increases sufficiently to provide a suitable profit margin.

7.304 LAW ENFORCEMENT

A. INTRODUCTION

The fiscal impact of growth in Mariposa County on law enforcement services will be substantial, in that police protection is an expensive service to provide, while it is also one of the most important services to local residents.

Law enforcement services in rural counties is complicated by the distances which must be traveled to answer calls, by poor roads, and, in this County, by the large number of tourists passing through the area. The large number of "second" homes further complicates the situation, in that the owners are not residents of the County and use these houses on an irregular basis. This increases the potential for burglary and theft, and causes a large number of house checks to be requested.

The policies outlined in this section will take into account both the fiscal impacts and assessed needs for continued adequate law enforcement service levels in the County, and will provide guidelines for future planning to maintain and/or improve current levels as the County's population increases over the next few years.

B. CONCERNS

The goal of the Sheriff's Office (SO) in this County is preventive rather than strictly reactive law enforcement. However, crimes rates, for the most part, are increasing nation-wide and Mariposa County is not exempt from this trend. Of primary concern in this County is lack of manpower to sufficiently cover the County area south of the Merced River. Law enforcement agencies can use national averages and industry standards for the ratio of sworn officers to population and support personnel to sworn personnel in order to provide residents with the most effective service, both to prevent crime and to ensure public safety.

The national average of law enforcement agencies is two (2) sworn officers for 1000 citizens, which is more easily expressed as 2 : 1000. This figure is generally recognized as the minimum officers to population ratio if optimum preventive and reactive law enforcement is to be achieved in a jurisdiction. However, in the County of Mariposa the ratio is 1.6 : 1000, in the area south of the Merced River. In reality, this figure is skewed because all sworn personnel are included in the calculation, and the Sheriff and the Undersheriff are not normally on patrol. Under normal circumstances, there are seven (7) deputies and two sergeants available for patrol duty, with one deputy position occupied with civil activity. Using the nine (9) positions available for patrol the ratio of officers to population is 1.1 : 1000. However, because of training classes, holidays, sick leave, etc., it is not uncommon to have only five or six deputies available for patrol. This situation brings the ratio of officers to population down to .7 : 1000, and these deputies must provide 24-hour coverage.

The practical impact of operating a law enforcement agency with such a low ratio of officers to population is that each deputy is being spred more thinly than the officer should be. The actual result of this impact is that it is much more difficult for patrol units to achieve an effective response time to citizens' calls, calls stacking up, little or no back-up for deputies, and large portions of the County not receiving adequate service when deputies have to leave their assigned areas to back up or stand in for other units.

This entire staffing shortage is complicated by the large area which must be patrolled. Therefore, it takes longer to respond to a call, and deputies must deal with poor roads, lack of signs, and other physical barriers.

In addition, deputies and sergeants must carry out investigative duties, because there are no full-time investigators in the SO. When combined with required civil activities which must be carried out, the patrol situation becomes critical.

The other major concern is lack of custodial facilities in the County. The Mariposa County Jail must house both juveniles and adults, since the County does not have a juvenile facility. Further, the State requires seven different segregations of prisoners,

such as juveniles and adults, felonies and misdemeanors, etc. The jail has only 20 beds at present; therefore, keeping prisoners properly segregated is a logistical nightmare, especially on weekends. In addition, the jail does not have a sufficient exercise area. Planning for capital facilities is obviously necessary before the problems become critical as the County grows.

Overriding the concerns discussed above is the County's financial ability to improve current police protection service levels, and, more importantly, to maintain an adequate service level as the County's population grows in the future. One of the primary policies that should be adopted as part of this section is that law enforcement service levels will not be allowed to fall below current service levels, no matter what the population growth rate becomes in the future.

The County has primarily achieved its current service level of police protection over the last few years through a substantial infusion of revenue sharing funds to the County general fund, which was then earmarked for Sheriff-Coroner's budget. This sum has varied from 48% to 60% of the SO's total budget in the previous four fiscal years and amounts to 46% of the FY 1979-80 budget. The long-term future for revenue sharing funds is uncertain. Although this potential permanent loss of funds may not directly affect the Sheriff's Office budget, it will certainly have implications for other County departments, since general fund monies would have to be reallocated to the SO to cover any future deficit.

C. METHODOLOGY

A thorough examination has been made of the adequacies, deficiencies, and problems encountered by the Mariposa County Sheriff's Office. The following factors were evaluated:

1. Adequacy of current service levels by the ratio of patrol deputies to residents.
2. Adequacy of investigative services, particularly for Part I crimes.
3. Adequacy of support personnel for clerical and evidence handling capacity.
4. The increases of criminal activity, non-criminal activity, and civil activity over the past few years as the population increased.
5. Projected costs of providing adequate service levels in the future based on population projections.
6. Level of activity and increase in costs for the responsibilities in coroner's cases.
7. Current needs and projected future costs for capital facilities.
8. Analysis of incident reports and civil activity by location, and the resulting logistical organization of personnel and services.

A full discussion of these factors can be found in Sections D and E. The policies proposed, therefore, represent the outcome of the total analysis of the factors outlined above.

D. INVENTORY

Table I - VII included in this section provide a statistical documentation of the increase in the Sheriff Office activity during the last five years.

Table VIII exhibits data on incident activity based on a sample month, March of 1980, by the time and area in which the incident occurred. For this analysis, the County was divided into areas as follows:

Area I:	North of the Merced River and including Lake Don Pedro
Area II:	West of Mariposa, Highway 140, and Ben Hur Road
Area III:	East of Mariposa, Highway 140 and Ben Hur Road
Area IV:	Town of Mariposa and its immediate vicinity

It should be noted here that incident activity was computed by area and number for August of 1979, in order to compare such data between a summer month at the height of tourist activity and an average month when incidents generally occur among residents of the County.

Incident reports for August, 1979, were up 7% over March, 1980. However, calls from Area I, the north part of the County, were nearly doubled during August. This can be partially attributed to recreation activities of Mariposa County residents, but the tourist impact must be recognized, since Area I contains the major recreational area of the County and an entrance to Yosemite National Park.

TABLE I

ALL INCIDENT REPORTS*

Year	Number	% Increase or Decrease
1975	2898	Base Year
1976	3493	20.5
1977	3588	2.7
1978	3851	7.3
1979	4390	14.0
	% Increase from Base Year	+51.4

* Incident reports computed here include every contact made to the Sheriff's Office, including information calls.

TABLE II

TOTAL ARRESTS
FELONY AND MISDEMEANOR

Year	Number	% Increase or Decrease
1975	632	Base Year
1976	530	-(16.1)
1977	660	24.5
1978	905	37.1
1979	875	-(3.3)
	% Increase or decrease from Base Year	+ 38.4

TABLE III

PART I CRIME SUMMARY

Felonies	1975*	1976 Base Year	1977	1978	1979	% Increase or Decrease
Homicide	2	1	2	0	0	- (100)
Rape	1	2	3	2	4	+ 200
Robbery	0	3	2	0	3	-
Assault	7	37	54	39	57	+ 54.1
Burglary	45	93	113	94	153	+ 64.5
Theft	35	97	123	108	221	+ 127.8
Total	90	233	297	243	438	
			% Increase or decrease from base year			+ 88

*Records incomplete for this year

TABLE IV

NON CRIMINAL REPORTS

Year	Number	% Increase or Decrease
1975	433	Base Year
1976	564	+ 30.3
1977	580	+ 2.8
1978	507	- 12.6
1979	564	+ 11.2
	% Increase or Decrease from Base Year	+ 30.3

TABLE V

CIVIL ACTIVITY

Year	Open Cases Number	% Increase or Decrease
1975	164	Base Year
1976	239	+ 45.7
1977	371	+ 55.2
1978	389	+ 4.9
1979	441	+ 13.4
	% Increase or Decrease from Base Year	+167.7

TABLE VI

CORONER CASES

Year	Number	% Increase or Decrease
1975	59	Base Year
1976	43	- 27.1
1977	57	+ 32.6
1978	68	+ 19.3
1979	50	- 26.5

% Increase or Decrease from Base Year - 15.3

TABLE VII

HOUSE CHECKS*

Year	Requests	Completed
1978	139	2493
1979	127	2535

*Records unavailable from 1975-1977

TABLE VIII

SAMPLE MONTH*
INCIDENTS BY AREA
AND TIME OF DAY

	AREA I	AREA II	AREA III	AREA IV	TOTAL
Midnight-6:00 a.m.	1	4	4	10	19
6:00 a.m.-Noon	12	10	22	20	64
Noon-6:00 p.m.	13	13	31	33	90
6:00 p.m.-Midnight	7	10	27	22	66
Total	33	37	84	85	239
% of Total	13.8%	15.5%	35.1%	35.6%	100.0%

Of the above number of incidents, 92 or 45% occurred on weekends.

* March, 1980

E. FISCAL IMPACT EVALUATION

SHERIFF'S OFFICE ACTIVITY LEVEL

As the population has rapidly increased over the past few years, the levels of law enforcement activity has risen porportionately. There has been a 51% increase in all incident reports handled by the SO since 1975, the base year for reporting purposes. These figures represent total agency activity--criminal, non-criminal, civil, and coroner cases.

Total arrests, both felony and misdemeanor, increased 38% from the base year, while Part I crimes increased approximately 88% during the reporting period. The major increases in Part I crimes were for burglary and theft. These increases correspond directly to several factors, such as the large number of second homes which are used on an irregular basis and are natural targets for burglary and theft, and the enormous number of tourists entering Yosemite National Park through the County, and using recreational facilities along the way.

Non-criminal reports increased 30% during the reporting period. This rise can probably be attributed to the growth in population, and the changing make-up of the County's residents. New residents who come from an urban environment have higher expectations of the law enforcement agency, and therefore demand higher levels of service.

Civil activity has increased 167% during the reporting period. This again can probably be attributed to the population increase, coupled with the economy. For example, repossessions have increased dramatically over the last year because of the combination of inflation and recession which have caused economic hardships.

There were 127 requests for house checks during 1979, made primarily by owners of second homes. 2,535 house checks were completed last year as part of patrol duty. While such activity is time-consuming, it is an important deterrent to burglary and theft.

The number of coroner's cases ranged from a high of 68 in 1978 to a low of 43 in 1976. While the coroner does not actually transport these cases, there is approximately two hours of clerical work involved in each case, causing a further drain on support personnel capacity.

Search and rescue operations are handled by an official search and rescue team made up primarily of Sheriff's Office reserves and volunteers. However, the SO often assists such operations, and is required by law to take over when the search and rescue operation becomes a coroner's case.

This a further drain on the deputies' available patrol time. It is difficult to assess manpower needs in this area, since operations are erratically scattered throughout the year. However, it must be noted that these operations are another activity which is handled by the SO, and can often require deputies' time and services.

It is clear, after evaluating agency activity levels, that as the population grows, more deputies and support personnel will be required. The County must plan for these increases if adequate levels of service are to be provided in the future.

MANPOWER

The current staff in the SO which are allocated positions and come out of the County's general funds are as follows:

Sheriff-Coroner	1
Undersheriff	1
Sergeants	3
Deputies	12
Animal Control Officer	1
Bailiff (Part-Time)	1/2
TOTAL	18 1/2

There are also five other positions in the agency which are funded through State and federal grants at no direct cost to the County.

A full discussion of current manpower, current needs, and future needs is included in a subsequent portion of this section.

RESPONSE TIME

Response time to a citizen's call is a critical factor in evaluating law enforcement service levels. A combination of under-staffing and large areas to patrol contribute to the rather high response times which occur in some sections of the County.

In the portion of the County north of the Merced River, resident deputies are either on patrol or on call, thus providing adequate coverage to most of the area in a reasonable time interval. However, in the large area south of the river, response times become more critical. This is partially caused by the necessity of assigning one patrol deputy to the Town of Mariposa area virtually 100% of the time. This is necessary, because the town area generates approximately 36% of the calls for service County-wide. In periods of low staffing, a patrol deputy may be responsible for the rest of the entire south-County area, which generates response times which are unreasonably long. It appears that the only way to reduce response times, especially during the busiest hours, is to either re-assign existing personnel, add personnel, or, preferably, a combination of the two.

CORONER RESPONSIBILITIES

In Table VI, which is included in Section D, Inventory, the incidence of coroner's activity is shown to increase and decrease from year to year. New legislation, however could increase the future case load by up to 50% over past levels, since every unattended death will be handled as a coroner's case.

This potential increase is further complicated by the escalating cost of performing an autopsy. In 1975 the cost was $80; in 1979 the cost had increased to $245. Further, the cost in 1980 could be as high as $295. A comparison of the total current and potential cost to the County is as follows, given the potential increase in cases brought about by the new legislation:

1975	1979	1980 and Future Years
$4,720	$12,250	$22,125 (at current cost)

This is a five-fold increase during the reporting period.

Over and above the increasing cost of autopsies and the potential increase in case load is the cost of processing each case. Approximately two hours of clerical time is required for each case, which would bring the total costs in future years to approximately $23,000 per year.

While future costs per case can be projected, there is no clear cut indication that the incidence of coroner's cases will be affected by future population growth, even though some years may have a coincidental increase over other years. Therefore, solid projections of future costs cannot be calculated.

FACILITIES

There are three needs for facilities which will have to be addressed in the near future. These are a juvenile facility, expansion of the present jail, and increased office space for the Sheriff's Office staff as it grows in correlation to population increases.

The juvenile facility could be incorporated into a jail expansion program, with a current projected cost of $500,000. The longer that this capital expenditure is put off, the more it will cost to build the facility. Of critical concern is the County's financial ability to pursue such a building program. Alternatives such as contracting with adjoining counties for jail and/or juvenile facilities appears to be unworkable, since those counties are at least as hard pressed as is Mariposa County for space and funds to expand.

County officials will soon have to effectively plan and program to meet this problem as it increases with the County's growth rate.

IMMEDIATE AND FUTURE LAW ENFORCEMENT NEEDS

In order to provide Mariposa County residents with both preventive and reactive law enforcement services, the Sheriff's Office would prefer to achieve the guideline ratio of 1:750 sworn officers to population. This ratio is higher than the recognized ratio of 1:500 or 2:1000, but is lower than the County's current ratio.

Other recognized personnel guidelines are one sergeant for each five officers, and one support person for each three officers.

Based on this goal and an analysis of current ratios and coverage, there is currently a shortage of personnel. To bring the agency up to this suggested guideline, an additional three deputies, two investigators, and one clerical support person would be required. In reality, this staffing level could be achieved by adding two deputies, one investigator, transitioning one currently grant-funded position to a combined investigator/juvenile position, and providing an additional clerical position. It should be noted here that the clerical support personnel currently perform not only clerical duties, but also double as matrons and dispatchers.

The cost to the County to provide this increased level of service in the first year would be as follows:

2 deputies:	$ 53,500	
Deputy/Investigator:	26,750	
Investigator/Juvenile:	15,000	(present grant position)
Clerical:	10,000	
Total	$105,250	

New sworn personnel incur first year costs above and beyond that of future years because of first-time costs for equipment, vehicles, radios, and training, which explains the cost effectiveness of transitioning the one currently grant-funded position. The subsequent cost in future years to bring the SO up to guidelines would be approximately $70,000 per year in salaries and benefits.

Within five years, conservative population projections place the County's population at approximately 15,800 people. In order to achieve a ratio of 1:750 by 1985, the following staffing would be required:

Sheriff:	1
Undersheriff:	1
Deputies:	21
Sergeants:	4
Investigators:	2
Animal Control:	1
Bailiff:	1
Civil Clerk:	1

Additionally, three more clerks could be required under the jail's budget in addition to other jail personnel. The cost in salary, benefits, equipment, and vehicles to add the required personnel by 1985 is $386,469, in addition to the personnel immediately needed which were discussed above.

Assuming population growth of 3,400 by 1985, the distributed cost is $114 per person or $285 per family. This does not include other budgetary items required to support this personnel. As a point of comparison, the current combined Sheriff's Office/Jail budget of $677,783 equates to $54 per person or $147 per family.

Law enforcement is admittedly an expensive proposition; however, it is one of the most basic, critical services that jurisdictions provide for their citizens. Therefore, as County growth policy is formulated by plans and policies, a decision will have to be made as to whether adequate law enforcement services will be provided in future years.

ALTERNATIVE POLICE COVERAGE

Other communities which face the same fiscal constraints as Mariposa County are exploring alternative methodologies to mitigate the costly proposition of adding a large number of new employees, particularly on patrol duty.

One such alternative is implementing a plan whereby each sworn officer is provided with full-time use of an equipped and marked patrol vehicle which is used in off-duty hours as well as on-duty hours. Essentially, this plan puts more vehicles and officers in full public view at all hours throughout the County. The reason for implementing this plan is that incidents such as theft, burglary, and assault are less likely to occur when heavy patrol coverage is assumed to be present.

Although this plan has primarily been implemented in urbanized areas, the idea could be particularly effective in a large rural county such as Mariposa, Where coverage is naturally diminished by miles of roadways.

The cost of vehicles, maintenance, and gasoline could be considerably lower than the cost of a large number of new salaries, benefits, equipment, training programs, etc., which must be expended for personnel. Such an approach could effectively help to reduce the ratio of deputies to population required to maintain adequate service levels.

7.305 FIRE PROTECTION

A. INTRODUCTION

Mariposa County's structural and wildlands fire protection responsibilities are shared by local, state and federal agencies.

Of primary importance in this analysis is the level of service currently provided by the County's all-volunteer firefighting force, which has the primary responsibility for structural protection, and the ability of such a system to adequately serve a growing rural populace.

In fiscal year 1979-80, County funds allocated to fire protection totaled $60,069 or .8% of the total County budget. This amount equates on a per capita basis to $5.00 per person, $14.00 per household, or an average of $4,005.00 per volunteer unit. This level of funding must be analyzed thoroughly, as dollar losses to structures and personal property from all fires during calendar year 1979 exceeded $775,000. Loss of structures and personal property caused exclusively by wildlands fires exceeded $126,000 in the same year.

B. CONCERNS

There is a recognized relationship between population growth and fire incidence, and Mariposa County's population has undergone a major growth spurt during the last three years. As property values, structural values, and population have excalated, so then have the dollar losses from fires.

Historically, the sparse rural population in the County had a different attitude toward fire incidence and fire prevention. An awareness of the individual responsibilities of property owners would naturally place less demand on County fire protection service levels. However, much of Mariposa County's population influx has been comprised of former urban dwellers with less understanding of the rural environment, coupled with a conditioned dependence upon public fire protection services. When this lack of experience and conditioned attitude is combined with a desire to locate dwellings on sometimes isolated large acreage parcels not intended or designed for resource conservation (i.e. agricultural, timber, or woodland use), the same sense of preservation or development of the property through fire preventative measures is often non-existent.

Therefore, fuel loading increases, and structural protection measures either don't exist or deteriorate. As population densities increase, former fire prevention measures such as individual large acreage controlled burns become too hazardous to undertake. The result is a combination of factors which place greater importance on the development of an effective structural fire protection agency or system which may not have been necessary as little as five years ago.

A primary deficiency in the present all-volunteer system is the lack of a 24-hour staffed unit anywhere in the County, except CDF units during the fire season. Volunteer units have responded to non-fire season fires as follows:

1975:	18
1976:	28
1977:	24
1978:	28
1979:	19

Total fire responses by volunteer units other than MPUD in 1979 were 94, or a County-wide average of 1.8 fires per week for the year. Also, the incidence of fires by unit responsibility area was in direct relationship to each areas's population density and growth.

Along with the increase of fire incidence, fire response times are of significant concern. It is of importance in this section that those response times are measured when the engine leaves the station, and do not include the time required to summon the volunteer firefighters. This delay has been reduced in recent years by equipping volunteers with alert monitors, which helps eliminate time-consuming personal notification by the dispatch agency. However, not all volunteers have been equipped with these devices, so coverage is not complete.

In 1979, funds were allocated for a training officer and a surplus training vehicle to provide on-going training programs for volunteers. This should improve the effectiveness and efficiency of the volunteer units in the future. However, another concern is that the equipment which has been acquired for the units is older, surplus equipment with limited capabilities. Further, not all units are fully equipped with the necessary apparatus to provide adequate fire protection.

All of these concerns are overridden by the financial impact of alleviating them; none can be addressed unless the County is willing and able to financially provide for improvements to the existing system. This will be addressed directly in Section E, Fiscal Impact Evaluation.

C. METHODOLOGY

A thorough examination has been made of the adequacies and deficiencies of the all-volunteer firefighting system by evaluating the following factors:

1. ISO ratings for all areas of the County, which are based on the hazard classification, availability of water, construction restrictions, fire supression capability, and communications systems.

2. The number of volunteers per unit and the average number of volunteers responding per fire.

3. The number and location of volunteer units.

4. An inventory of equipment and capability by volunteer unit.

5. The equipment required to suppress a normal two-story blaze, since large numbers of mountain dwellings are vaulted roof or loft-type construction.

6. New volunteer units recommended based on population growth and increased assessed values.

7. The cost of facilities and equipment for a new volunteer unit.

8. Possible future alternative methods to provide fire protection.

D. INVENTORY

The following tables and maps depict the fire protection situation which currently exists in Mariposa County.

TABLE I

Volunteer Unit	Number of Volunteers	Number of Fires	Average Number Vol. Responding	Average Known* Response Time (in minutes)
Bear Valley	10	2	5	No Report
Buckeye	3	No Report	-	-
Cathey's Valley	17	11	6	13.8
Coulterville	12	12	5	4.0
El Portal	15	No Report	-	-
Fish Camp	15	1	14	13.0
Greeley Hill	7	7	4	18.3
Hornitos	15	6	3	16.5
Hunters Valley	16	1	6	8.0
Indian Peak	10	5	4	29.0
Lushmeadows	14	14	5	18.3
Midpines	14	17	8	8.7
Mormon Bar	15	13	7	15.2
MPUD	17	17	7	4.1
Ponderosa Basin	15	5	10	20.3
Wawona	7	No Report	-	-

*Averages based on response time reported to dispatch unit= times are not always reported due to communication equipment failure, or failure to report

TABLE II

Eng. #	Unit	Number of Volunteers	# Fires 1979	Age of Engine in years	Physical Facilities	$ Deficiency Equipment Only *
# 25	Bear Valley	10	2	16	Private Garage	$ 9,901
# 23	Cathey's Valley	17	11	23	Fire Station	7,364
	Coulterville	12	12	14	Fire Station	4,271
# 261	Coulterville			31	"	2,978
# 26	Coulterville			43	"	3,922
# 34	El Portal	15	0	31	Fire Station	8,323
# 33	Fish Camp	15	1	28	Fire Station	2,373
# 331	Fish Camp			23	"	6,321
# 31	Greeley Hill	7	7	20	Fire Station	5,071
# 31 (Tanker)	Greeley Hill			28	"	9,312
# 24	Hornitos	15	6	16	Rented Barn	10,438
# 36	Hunters Valley	16	1	30	No Facility	7,387
# 28	Indian Peak	10	5	16	Fire Station	7,930
# 29	Lushmeadows	14	14	30	Fire Station	7,104
# 21	Midpines	14	17	17	Fire Station	4,943
# 27	Mormon Bar	15	13	21	Fire Station	5,720
# 32	Ponderosa Basin	15	5	27	Fire Station	7,402
# 35	Wawona	7	0	34	Fire Station	8,057
					Total	$118,817
	Alert Equipment					33,000
					Total	$151,817
TOTAL 18		182*	94*			

*Not Including MPUD & Buckeye

COULTERVILLE - GREELEY HILL PROT. AREA

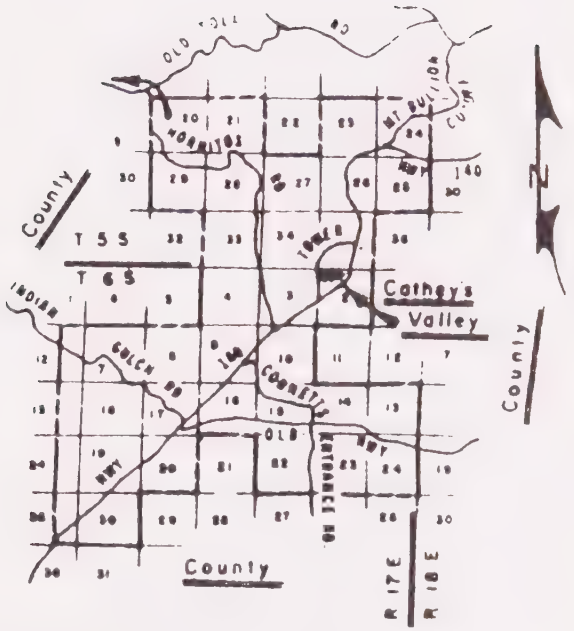
MARIPOSA COUNTY, CALIFORNIA

AS EXISTED FEBRUARY, 1977

PROTECTED AREA LIMITS ---------- CLASS 9

0 1 2 3 4 5 6

SCALE IN MILES



CATHEY'S VALLEY PROT. AREA

MARIPOSA COUNTY, CALIFORNIA

AS EXISTED FEBRUARY, 1977

CLASS 9

PROTECTED AREA LIMITS ———

0 1 2 3 4 5 6

SCALE IN MILES

CLASS 7

MARIPOSA P U.D.

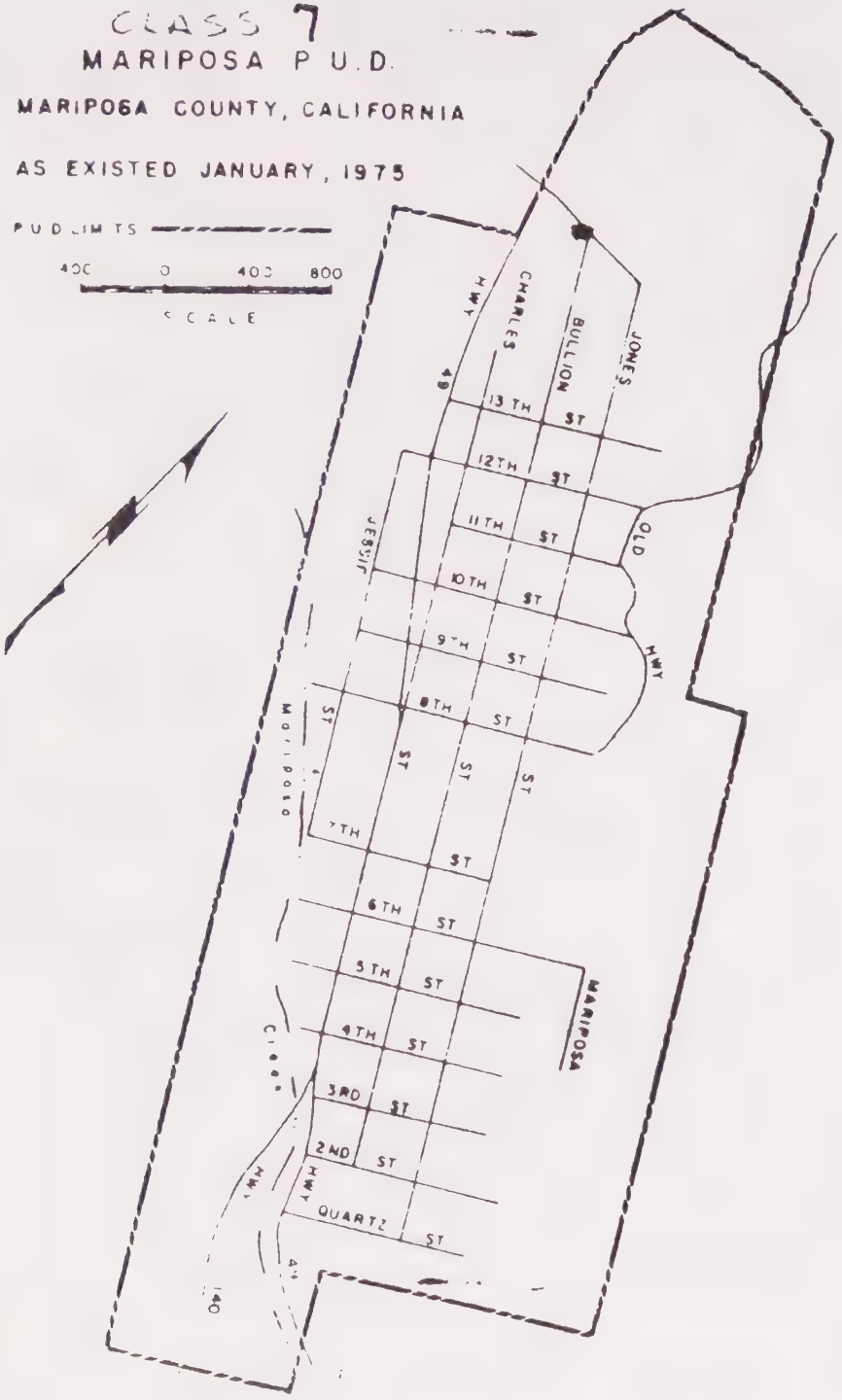
MARIPOSA COUNTY, CALIFORNIA

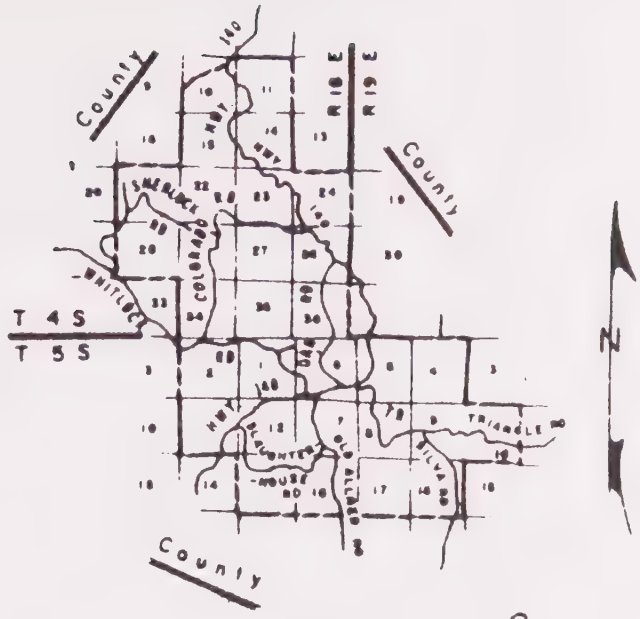
AS EXISTED JANUARY, 1975

P U D LIM TS

400 0 400 800

SCALE





CLASS 9

MIDPINES PROT. AREA

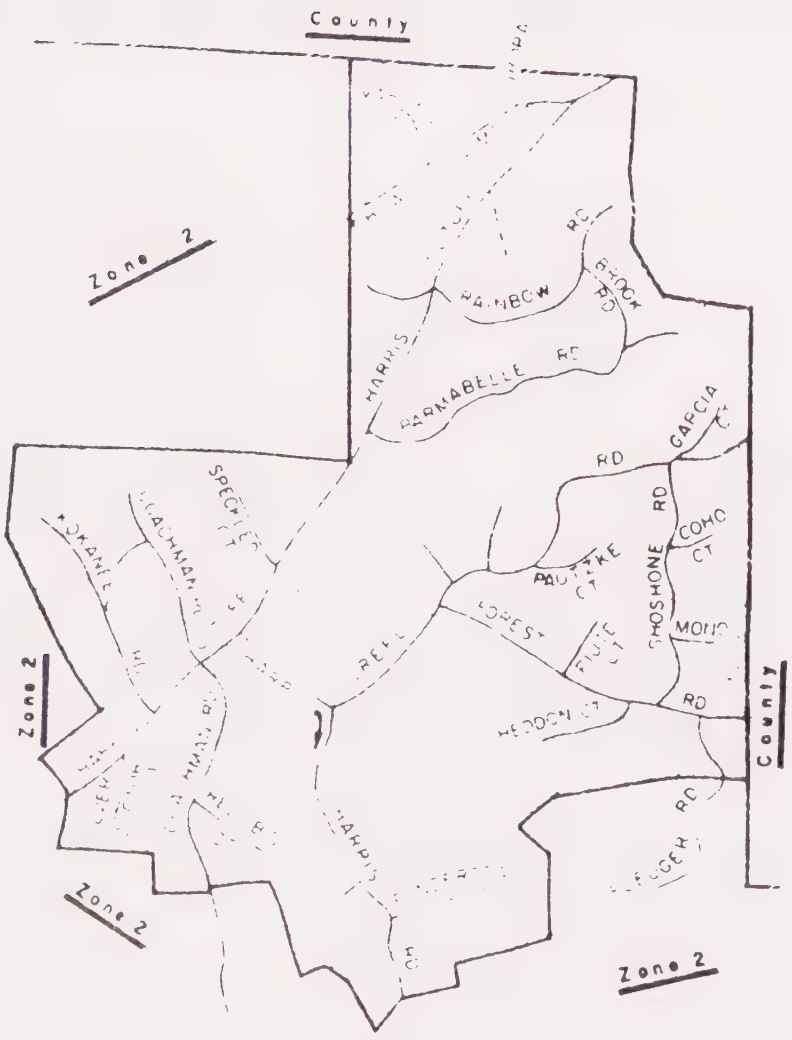
MARIPOSA COUNTY, CALIFORNIA

AS EXISTED FEBRUARY, 1977

PROTECTED AREA LIMITS

0 1 2 3 4 5 6

SCALE IN MILES



PONDEROSA BASIN PROT AREA

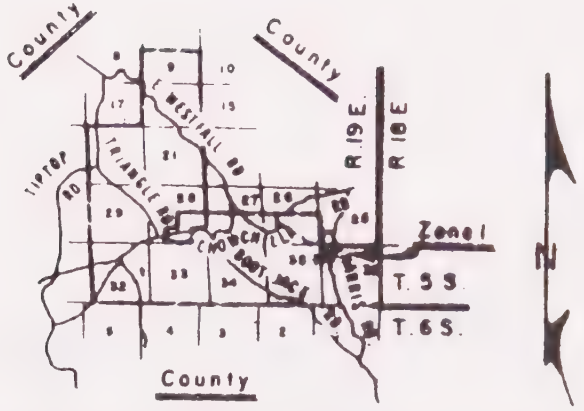
MARIPOSA COUNTY, CALIF

AS EXISTED FEBRUARY, 1977

PROTECTED AREA LIMITS

CLASS 9

CLASS 9



PONDEROSA BASIN PROT. AREA

MARIPOSA COUNTY, CALIFORNIA

AS EXISTED FEBRUARY, 1977

PROTECTED AREA LIMITS

ZONE 1 – See Following Map(s)

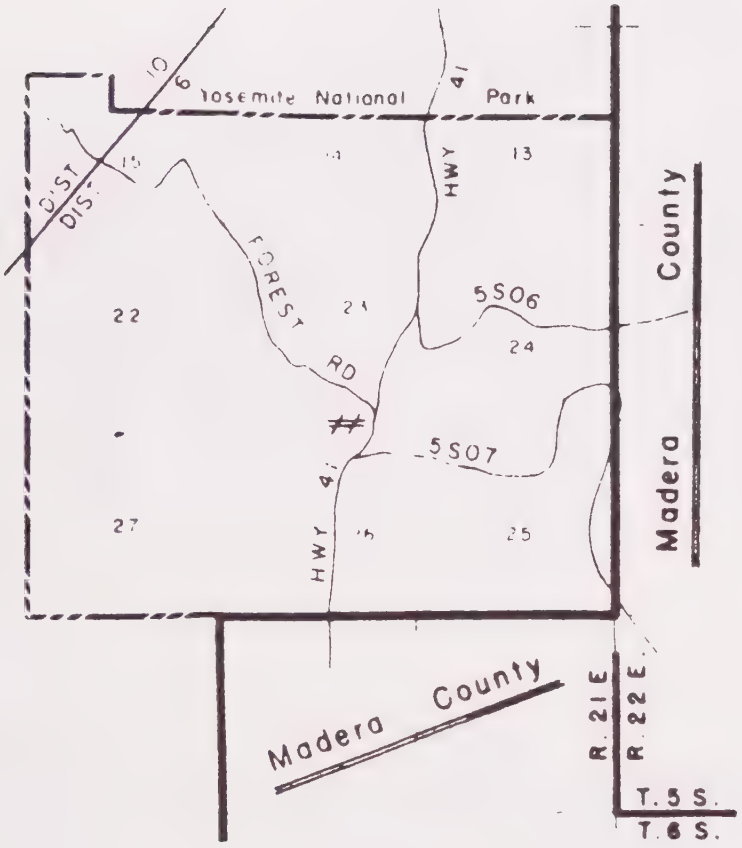
ZONE 2

0 1 2 3 4 5 6

SCALE IN MILES

Zone 1 – 7

Zone 2 – 9



FISH CAMP PROT. AREA - 9

MARIPOSA COUNTY, CALIFORNIA

AS EXISTED MAY, 1978

COUNTY LINE

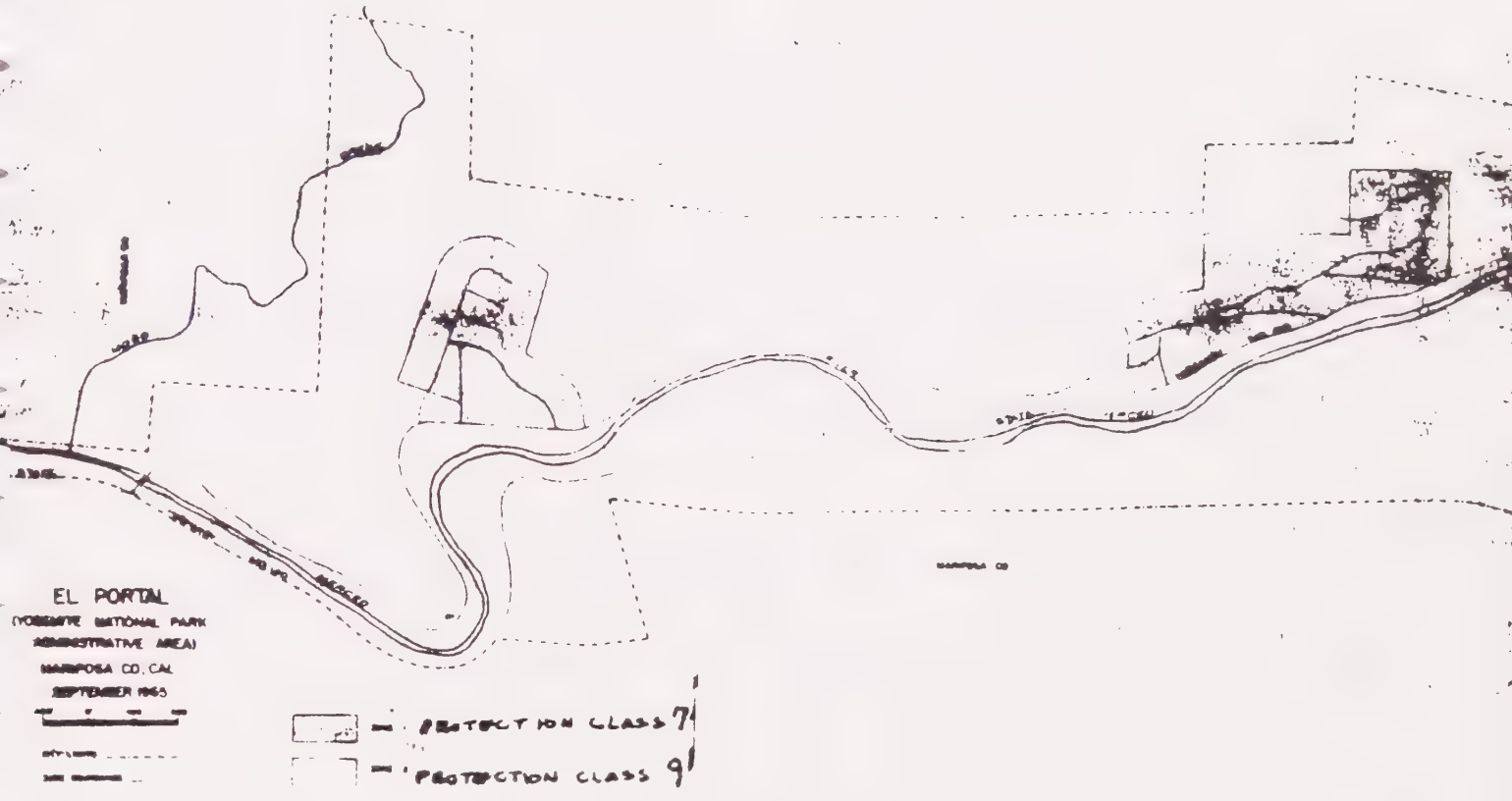
PROT AREA LINE

DISTRICT LINE

0 1/4 1/2 3/4 1 2

SCALE IN MILES

N


EL PORTAL
(YOSEMITE NATIONAL PARK
ADMINISTRATIVE AREA)
MARIPOSA CO., CAL.
SEPTEMBER 1965
PROTECTION CLASS 7
PROTECTION CLASS 9


YOSEMITE NATIONAL PARK
PROTECTION CLASS 8

ZONE 2
PROTECTION CLASS 9

I. S. O. RATINGS

The majority of the County has an ISO (Insurance Services Office) rating of ten, which is the highest rating assigned for fire insurance purposes. ISO ratings are based on water supply, fire services, construction standards, fire service communications, and fire safety control.

Those areas of the County that have a rating of less than ten are shown in the attached maps. Mormon Bar, which has a rating of nine, has as yet not had its boundaries defined by a map.

E. FISCAL IMPACT EVALUATION

For the purposes of evaluating population growth and development on current levels of fire protection services, the fiscal impacts of increased manpower and equipment, fire insurance rates, and alternative fire protection systems will be discussed. It must be recognized that there are current deficiencies in the present level of services; therefore, the fiscal impacts of bringing the system up to minimal protection standards and/or guidelines will also be evaluated.

1. Manpower

The inventory of fire protection units, manpower, and equipment can be found in Section D. In summary, there are presently 15 volunteer units scattered throughout the County in small communities. These units are staffed by 182 volunteers. (For the purposes of this evaluation, MPUD and the Buckeye unit's figures have been omitted, since MPUD's unit is funded with special district funds, and the Buckeye unit is not currently operative) CDF recommends a minimum of 15 volunteers per unit; however, only half of the 15 units currently have 15 volunteers. This short staffing is intensified in that most of the units have only one-third to one-half of their available volunteers responding to a fire.

The ISO standards call for at least 12 men and one officer to respond to a fire alarm; however, CDF recommends five men per engine and one officer, or a total of 11 men responding. In Mariposa County, the average number of volunteers responding to a fire range from 5 in Coulterville to 14 in Fish Camp. This lack of manpower results in longer response times, less efficiency when the fire unit arrives, and a larger property loss. Since each unit receives an average of only $4,000 per year from the County of Mariposa, it well may be the case that lack of manpower is not caused by low community interest, but is caused by lack of equipment.

2. Equipment

Table II in Section D of this report shows the deficiencies in equipment and the age of the engines by volunteer unit. In order to achieve CDF recommendations, it is important to realize that approximately $152,000 would have to be spent immediately to bring the volunteer units up to standard. These equipment deficiencies in dollar amounts range from approximately $5,000 for Midpines to over $10,000 for the Hornitos unit. The major deficiency in each unit is in the lack of basic safety equipment. Only nine of the 15 volunteer units are equipped with equipment to combat a two-story blaze. Another factor in evaluating the equipment available is that the newest engines available to the units are 16 years old, while the oldest unit is 43 years old. Most equipment is bought from CDF's surplus. This primarily outdated equipment, coupled with the lack of other equipment and apparatus, contributes to this critical situation.

It is also important to note that this deficient level of equipment and manpower is current. As the population grows rapidly, fire service levels will fall even further. Therefore, this area needs to be addressed now, before future population growth's impact can worsen the situation to an extremely critical level.

3. Facilities

The majority of the volunteer units have a minimally equipped fire station. While these are not fire stations in the fullest extent of the term, they are structures in which engines, tankers, and fire fighting equipment can be housed. However, some unit facilities include a private garage, a rented barn, and having the engine covered with canvas.

The best estimates show that a community, using primarily volunteer labor, could build an adequate fire station for approximately $30,000. However, capital improvements become less important than acquisition of needed equipment when funding levels are critically low. In order to bring the facilities of all units up to an acceptable level, the County of Mariposa should consider basic facilties for Bear Valley, Hornitos, and Hunters Valley to be of high priority for at least partial funding. These could consist of matching funds against local in-kind activities or up to full funding. Given the large number of volunteer hours contributed by the units, County financial help should be forthcoming in order to provide adequate levels of service.

4. Response Time

According to CDF guidelines, 7 1/2 minutes is the outer limit of a desirable response time* in order to save a structure. After that amount of time, structural protection effectiveness decreases dramatically, and a response time of 15 minutes or over constitutes little fire protection.

Of the 15 volunteer units in the County, only the Coulterville units had an average** response time to all alarms of under 7 1/2 minutes. Approximately half of the remaining units had an average response time of 7 1/2 to 15 minutes. The rest of the units' response times were over 15 minutes, which means that a substantial number of dwellings have, in effect, a reduced chance of actually saving the structure.

The major cost in improving the response times of the volunteer units is the money necessary to equip each volunteer with an alert monitor. At present, approximately 1/3 of the volunteers are equipped with such emergency alert equipment, and 1/3 of these have been purchased by the volunteer companies at their own expense. Since each unit costs $300, most volunteers would not be able to afford such equipment. Therefore, it is of high priority for the County to allocate funds so that all volunteers are equipped, thus cutting down on costly time needed to individually alert each person.

Further, the fire training officer should be encouraged to concentrate on rapid movement when the alarm is given. Special training programs should be on-going, and additional training should be available based on the County Fire Warden's recommendations.

Specific policies should be adopted which promote subdivision development in areas of existing adequate fire suppression services, and which discourage intense development activity outside a 15-minute response time until a methodology is devised and adopted which will make fire protection services outside of such response time cost effective, or unless the developer is willing to provide financial assistance for fire protection services in the development area.

5. Immediate and Future Fire Service Needs

In order to evaluate the need for new volunteer units, the location of building permits, subdivision maps, and growth trends have been analyzed. From this analysis, it can be concluded that there is an immediate need for a fire protection unit in the Bootjack area. The area is currently served by Mormon Bar, Indian Peak, and

*Response time means the amount of time from when the engine leaves the station until its arrival at the fire.

** Averages based on response times reported to CDF dispatch unit.

Lushmeadows units. However, a great deal of development activity has recently been and is currently being processed in the Bootjack area; therefore, it is the first priority area for new firefighting units.

There is also a great deal of development activity in the Buckeye area. While that volunteer unit is currently inactive, a base does exist for expanding it into a functioning firefighting unit. This area would be considered a second priority in new additional fire service providers.

The Lake Don Pedro area is currently served by a volunteer unit located in Tuolumne County. As building progresses there in the future, consideration should be given to the formation of a firefighting unit to serve the development located in Mariposa County. This unit could negotiate a mutual aid agreement with the unit across the County line to provide full fire service protection in that area. It should be noted that build-out rates and further development in that area are substantial, and firefighting services should be planned now, instead of waiting until the need becomes critical.

The locational trends of growth and development will be monitored in the future to recognize other areas which could become under-protected. This effort will be on an on-going basis, so that the trends can be incorporated into reviews of the policies of this document, and proper planning can be carried out.

6. Costs

While the cost of bringing existing volunteer units up to CDF's minimum standards has already been discussed in this section, it is important to know for future planning purposes how the costs of establishing a new firefighting unit would be broken down. For the purposes of this analysis, the assumption is that any new unit would measure up to CDF minimum standards from the outset. Using this assumption, current costs for new units would be as follows:

Engine:	$5,000	(Assuming that surplus equipment is available)
Alert Monitors:	4,500	(for 15 volunteers)
Basic Safety Equipment:	6,975	(for 15 volunteers)
Other Firefighting Equipment:	4,729	
Total	$21,203	

This total is only for equipment and apparatus, and does not include the costs of land acquisition and capital improvements or facilities. In light of the total costs of $50,000 to $60,000 for a completely equipped station, consideration must be given to alternative funding sources. For example, if a subdivision is developed outside of a 15-minute response time, which is considered to be unprotected, the developer could be responsible for at least some of the costs to provide fire service for that area. This could be in the form of development fees for firefighting services, dedication of land, and construction of a fire station. Whichever method is adopted by the Board of Supervisors of Mariposa County could then be incorporated into the appropriate ordinances, plans, and policies which affect development in the County.

7. Fire Insurance Cost to Community

As shown below, the cost of annual fire insurance premiums resulting from the majority of dwellings in the County being located in areas rated by ISO as ten is far in excess of the monies expended for fire protection.

Value of Dwelling	Annual Insurance Premiums by Protection Class Rating		
	7 & 8	9	10
$ 50,000	$156	$203	$261
80,000	228	296	381
100,000	276	358	461

In 1980 the estimated number of dwellings in the County which would be covered by fire insurance is 6,195 (which includes permanent and second homes as well as unfinished dwellings).

Based on ISO maps for Mariposa County and estimated 1980 populations for ISO rated areas, approximately 1,450 dwellings are located in an area rated 7, 8, or 9. The remaining 4,745 dwellings are located in an area rating of ten. The annual cost to the community of the differential between a fire rating of 10 and a fire rating of 9 based on an average value of $50,000 is currently $275,100.

By 1985, the cost of the annual fire insurance premium differential could increase to $584,460, based on current population and building projections, and an increase in average dwelling values to $80,000 (that is an annual housing value increase of 10% per year over five years).

The uninvested dollar cost to the community over twenty years is $10,142,400. Were these sums invested by the community at 7% for the first five years and 6% for the next 15 years, the cost to the community in fire insurance premiums differential over a 20-year period is $16,111,398.

7.306 PARKS AND RECREATION

A. INTRODUCTION

Within the County of Mariposa, recreation needs and facilities can be divided into two major categories; on the broad scale recreation and tourism is an industry within the County that represents a significant portion of the local economy. On a more local scale, there are recreational area and facility needs of local residents.

Mariposa County attracts many visitors each year to visit and enjoy Yosemite National Park and the National Forests of the Sierra Nevada. Over one half of Mariposa County is publicly owned lands of the National Park, National Forests, or Bureau of Land Management. Seasonal tourist recreation is a major building block of the Mariposa County economy. Over recent years the numbers of people traveling to Mariposa County have steadily increased with estimated visitation at Yosemite National Park approaching three million persons per year.

With the rapid growth of Mariposa's population in recent years, several factors have increased the need for recreational areas and facilities. The rapid conversion of unimproved land to residential subdivision uses has diminished the supply of open space areas and increased local usage of BLM, National Forests and Yosemite National Park by local residents. Park facilities with picnic, playground and other improvements are increasingly in demand. New semi-urban centers have been established and historic population centers have grown at a rapid rate.

Mariposa County with a rapidly growing population, limited revenue raising resources, high seasonal tourist and visitor counts, and large tracts of federally managed land, has a number of unique opportunities. Public recreation for County residents and visitors alike create potentials for improving the visitor experience to the County and bolster the local economy and improve the quality of life for the local populace. The unique historic resources of the County in addition to the natural wonders of Yosemite and other federally managed land areas and the boating and fishing recreational opportunities of the Merced River and Lake McClure attract new residents and visitors alike. Though a well orchestrated program of improving these basic resources and developing support facilities and programs, recreational services and their related benefits can be improved.

B. CONCERNS

There are several deficiencies in the present physical arrangement of parks and facilities. For example, there is not currently an adequate public golf course in the County. Lake Don Pedro residents are served with a private course, but residents of other parts of the County must buy a membership in order to use the facility. This is not to suggest that the County should build and maintain a golf course; it simply points out the need for such a facility which could be either publicly or privately owned and operated.

There is also a lack of equestrian trails within the County. There is a great deal of local interest in such a trail system, so it can be considered to be an expressed need of local residents from many communities in the County.

Among the actual County-owned facilities which are currently needed is completion of the Woodland Park facility in the Bootjack area; lighted athletic fields for team sports on the Northside of the County and in the Mt. Bullion/Mariposa/Bootjack area; a community center in Mariposa for program recreation activities; and a bicycle/pedestrian trail along Highway 140 in Mariposa to provide better access to facilities in Mariposa Park. Approximately $350,000 would be needed over the next few years to construct these facilities; much of it could possibly be funded through State grants, particularly if such projects were included in a master plan which would help identify State requirements for funding.

C. METHODOLOGY

The following factors were analyzed in order to evaluate the parks and recreation system in Mariposa County:

1. Adequacy of the current County park sites and facilities.
2. Projected improvements and costs to upgrade current facilities.
3. Past and current costs per capita for the parks and recreation system.
4. State grant monies which have been expended or earmarked during the last few years for the County parks and recreation system.
5. Traffic and usage analysis of federal recreation areas by origin and destination, seasonal trends, and percent of total recreational traffic and use by area and activity.

D. INVENTORY

The following sites and facilities comprise the current County-owned parks and recreation system:

1. Catheys Valley Park - facilities currently consist of a community hall with kitchen facilities; picnic benches; fireplaces; an automatic sprinkling system; well and pump; paved parking area and entrance; inside and outside restrooms; a water system; and lawn and trees. The community hall will be doubled in size beginning in July, 1980, at a cost of $25,000. Funds will come from a 1976 California State Bond Act project. Site size: 5 acres.

2. Coulterville Park - facilities currently consist of a swimming pool; dressing rooms; restrooms; picnic area; barbeques; lights; horseshoe pits; playground equipment; sprinkler system; and a turf area. Two tennis courts were installed with $29,000 of 1974 State Park Bond Act Funds; these courts need to be lighted for night-time use. First priority for improvements will be a new bathhouse and restroom complex to replace currently inadequate facilities. Funds for this project have not been located at present. Site size: 2 acres.

3. Darrah Park - facilities currently consist of a community hall with kitchen facilities; picnic benches and fireplaces; a water system; parking area; and playground equipment. New restrooms and a septic system were installed in 1977 for $4000 of County general funds. New playground equipment and fencing have recently been added at a cost of approximately $4000 of County funds and donated labor and materials. Site size: 1 acre.

4. El Portal Park - facilities currently consist of a swimming pool, built in 1979 with approximately $75,000 of 1974 and 1976 State Park Bond Act funds and $8000 of federal revenue sharing funds; tennis courts built in 1975 with $3000 of County general funds and $4000 of donated labor and materials. In 1978 the National Park Service committed itself to funding and installation of night lights for the tennis courts. Site size: 2 1/2 acres.

5. Hornitos Park - facilities currently consist of a community hall with kitchen facilities; a storage area; fenced-in park area; picnic and fireplace facilities; lawn and trees; restrooms; a water and sprinkling system; playground equipment; a basketball court at a cost of approximately $2000 in County labor and donated materials. The most pressing need is the renovation of the Community center, which is planned to go into engineering studies in FY 1980-81. Site size: 1.30 acres.

6. Mariposa Park - facilities currently consist of a swimming pool; dressing rooms; restrooms; a picnic area with tables and fireplaces; an outdoor theater, stage, and storage; tennis courts with night lights; a sprinkling system; parking facilities; lawn and trees; playgorund equipment; and an office building. In 1979 an additional tennis court and a double practice court were added along with an irrigation system for $29,000 of 1974 State Bond Act funds. A $45,000 1976 State Park Bond Act grant will be utilized for a new restroom and bathhouse and an acrylic surface on the three tennis courts. Site size: 14 acres.

7. Red Cloud Park - Picnic tables; a water system; lights; restrooms; a deep-pit barbecue; and a cement slab. With $10,000 from the 1976 State Park Bond Act, the park was improved with a rock wall; refurbished restrooms; a new water system; night lights; an outdoor sink; twelve barbeques; and twelve picnic tables. Site size: 7 acres.

8. Woodland Park - a $45,000 allocation of the 1976 State Park Bond Act was used to begin park facilities in the Bootjack area. $30,500 was used to purchase the site, and remaining bond monies are being reserved to use as possible matching funds for a development grant. Further the old Oak Grove Park site and facilities were sold by the County in 1978 for $12,000; this money will also be used to develop the Woodland Park site. Site size: 10.5 acres.

It should also be noted that elementary schools in the various communities are utilized for playground activities when weather permits.

RECREATION PROGRAMS

The County Parks and Recreation Department is involved with various Little League, softball, volleyball, etc., programs in various communities in the County, primarily through funding for facilities maintenance and utilities. The County is also responsible for running the swimming pools located in Mariposa, Coulterville, and El Portal. With limited physical facilities other than in the Town of Mariposa, the County limits organized recreation programs for which it would be responsible.

FEDERAL RECREATION AREAS

The table on page ___ shows the major federal recreation areas and their usage levels using the most current data. It can be assumed that over the past few years, these levels have generally remained the same or have grown. These data only address use by tourists, and do not reflect the heavy usage of the areas by local residents.

E. FISCAL IMPACT EVALUATION

1. Grant Generated Revenues

An evaluation of the fiscal needs and the impacts of future population growth on the County parks and recreation system is two-fold. The first is those improvements which could be grant-funded, thereby lessening the strain on County general funds.

Since 1974, approximately $400,000 has been allocated to Mariposa County through the State Parks and Recreation Bond Act, of which all has been expended or earmarked for specific projects as outlined in Section D, Inventory. One of the main problems that could arise in the future regarding successful grant funding for the County is the lack of a master plan for parks and recreation. In a period of tight State funding, such as currently exists, a systematic approach to capital improvements budgeting, as well as facilities planning, is considered to be an important factor at the State level. Therefore, since the County needs State funds to complete its park system, any steps such as master planning should be of high priority in order for the County to be competitive in grant selection.

Round Trips Per Year By Recreation Facility
and By Rank - CALTRANS Data (1976)

	FACILITY	ROUND TRIPS PER/YR.
1.	Yosemite National Park	669,464
2.	Lake McClure	60,061
	McClure Point	(21,791)
	Barrett Cove	(18,587)
	Horseshoe Bend	(17,763)
	Bagby	(1,664)
	Hunters Valley Point	(256)
3.	Lake McSwain	18,562
4.	Highway 140 - Mariposa to El Portal	11,792
	Indian Flat	(3,155)
	KOA-Midpines	(3,106)
	Cedar Lodge	(1,799)
	Briceburg to Hail Gulch	(1,631)
	Redbud	(1,421)
	Bear Creek Campgrounds	(680)
5.	Sierra National Forest	2,749
	Summit Camp	(1,842)
	Jerseydale Campground	(710)
	Crows Foot Campgrounds	(197)
6.	Buck Meadows Resort	1,834
	Dispersed Area - County-wide	5,010
	TOTAL	769,472

Current facility needs as discussed in Section B, Concerns, would require an additional appropriation of approximately $350,000 over the next few years. Assuming that master planning were accomplished with community input, this estimate could be higher or lower. Community input in the planning process is a required element of State funding to insure that local government recognizes the needs of each community, as population growth occurs and demographic makeup of the community changes. The master planning approach, and the planning processes entailed, would hopefully lead Mariposa County away from a "catch-up" posture to one of actually providing expanded recreational opportunities to all segments of each community as needs arise and are expressed at the community level.

2. Fiscal Impacts to County General Funds

Depicting the dramatic increase in the cost of providing recreational services and facilities to County residents is the following review of the County Parks and Recreation Department's budget which is not reimbursable by grant funds. In 1975-76, the Department's expenditures were $75,805, or $21 per family, or $9 per capita. The current year's budget is $182,307, or $43 per family, or $16 per capita.

Even if the cost per capita were to remain static over the next five years, based on current population projections for 1985, the Department's budget could reach a total of $252,272. It is reasonable to assume that this is a minimal projection, as staffing requirements are certain to grow in relationship to community participation in recreational programs and services. Therefore, if the same percentage increase in costs held over the next five years, as has occurred during the past five years, the County could be faced with a budget in 1985 of $25 per capita, or $394,175.

3. Alternative Funding and Levels of Service

Given the County's financial constraints on revenue generation, the following major alternatives are available to the County recreation program:

1. Imposition of user fees.

2. Provide tourist related recreation services as a revenue source.

3. Initiate a tax override to support recreation.

4. Impose development fees to support recreation services.

5. Reduce recreation service levels to fit resource availability.

These alternatives should be studied immediately and decisions made in order that the County can approach the subject of parks and recreation in long-range terms. The alternative is a deficient recreational program with expensive by-products such as loss of State and local revenues and potential decreased attractiveness to prospective residents.

7.307 STREETS AND ROADS

A. INTRODUCTION

The County of Mariposa maintains approximately 558 miles of County roads. There are 706 miles of roads not included in the County inventories identified as public roads. County roads have been classified according to the "Department of Transportation, State of California Definitions" in the following manner:

76 miles	Arterials
129 miles	Collectors
353 miles	Minor
558 miles	Total

Additionally, the County contains a large number of private roads, not maintained by the County, but are utilized as public right-of-ways. The extent of this "Private" road system is unknown at this time.

B. CONCERNS

The primary concern regarding streets and roads in Mariposa County is the ability of the County to maintain the existing road system and to improve those portions of the system impacted by new growth and development. Of secondary concern is the future use of the"private" raod system and ultimate responsibility for the systems maintenance and upgrading in future years.

The existing County street and road system is slowly being upgraded but the overall program is limited due to lack of available financing. The bulk (42% of the 1979-80 revenues) of new street and road funds are derived from state sources, nearly 23% come from federal sources and the balance from various county revenue sources, including property tax, fines, etc. A little over 8.7% of all road and street revenues are derived from property tax sources. The growth of these revenue sources have not kept pace with the increased rate of street and road usage and cost inflation.

C. METHODOLOGY

Overall costs of county street and road maintenance and construction are evaluated from the standpoint of basic maintenance, paving and construction. Maintenance is the cost of patching, grading, sign maintenance and replacement, and bridge maintenance. These costs are assumed to apply to the entire county road system to maintain the system in its present condition. Paving includes resurfacing or overlaying of existing roads with some minor realignment. Construction is the realignment, construction and surfacing of an existing road or easement or acquiring of new easements, construction and surfacing of new roads.

Construction of streets and roads result in a short term reduction of maintenance costs, however all streets and roads have a usable life expectancy and with age require higher per mile maintenance costs. For purposes of analysis, the 1979-80 County Road Department "actual" budget was utilized to identify cost sectors. Table I describes these costs by function.

TABLE I

Engineering, Advance Planning and Administration			$ 153,064
Paving and Construction	Maintenance	Paving	Construction
Roads and bridges	-0-	$ 315,511	$ 217,527
Planning/Engineering/Admin.	-0-	-0-	49,705
Right of Way	-0-	-0-	6,900
Miscellaneous	-0-	-0-	3,677
Maintenance			
Roads and bridges	$ 694,515	-0-	-0-
Total	$ 694,515	$ 315,511	$ 277,809

Based upon the above figures, street and road maintenance costs in Mariposa County are approximately $1,245 per mile. This figure compares to a maintenance study referred to in a Master EIR prepared by the County of Modoc where maintenance costs are estimated at $1,150 per mile, as the average in Northern California. Federal and state funds available for maintenance average $810 per mile for the total miles of the system. Remaining costs are financed by other sources mostly of local origin. Paving and construction costs are not translatable into an average per mile figure based upon total county road mileage. Paving and construction usually cover a relatively short section of road and the construction activity costs vary dramatically due to terrain. Furthermore, the paving and construction would not be repeated on a specific section of road for many years. New construction costs or reconstruction costs are estimated to be an average of $100,000 to $150,000 per mile for excavation and alignment and an additional $100,000 for base rock and paving. Average costs per mile are $200,000 to $250,000 per mile for major construction or reconstruction. Minor reconstruction may not exceed $30,000 to $45,000 per mile depending upon the type of minor construction.

Street and road construction costs are significantly affected by the type of construction or reconstruction required. Steepness of terrain, water course crossings, alignment, easement acquisition, etc. all affect the costs of a construction project. Roads and streets are able to carry a specific volume of traffic and that volume is affected by the design and improvement of the road. Most paving and construction projects are required to improve the capacity of the road to carry higher volumes of traffic. For purposes of analysis, two variables need to be compared to determine timing, type, and degree of construction or reconstruction required. These variables are roadway capacity and trip generation methodologies.

1. Trip Generation

   Definition - The number of hourly or daily vehicle trips that can be expected to be generated to or from a location based on land use and/or socioeconomic considerations.

   The evaluation of trip generation involves the establishment of a Design Hour Volume (DHV) during some peak hour. The peak hour will generally occur during the morning and again in the afternoon. This volume is basically a percentage of the total daily traffic generated.

   In calculating the design hour volume, the following factors must be considered:

   a. Daily trips generated from land use or socioeconomic characteristics.

   b. Peak Hour Factor which relates daily trip generation to a single hour peak volume.

   c. Occupancy Factor which relates rural to urban conditions, especially land use.

d. Percentile level of the design hour that is desired.

e. Number of units or floor area that generates the traffic volume.

A typical equation for design hour volume related to residential land use is as follows:

DHV = trips (phf) occupancy (percentile) no. of lots

where:

DHV = Design Hour Volume at Peak Hour
trips = Daily trips generated per unit
phf = Peak Hour Factor
occupancy = Percent of units occupied on the design day
percentile = Percentile level desired during the design hour
no. of lots = Number of units in the design area

This basic equation can be used to evaluate traffic generated by a proposed development as well as to evaluate existing conditions. The factors to be used are, often times, not clear cut and a certain amount of judgement will be required.

2. Roadway Capacity

Definition - Maximum number of vehicles that have a reasonable expectation of passing over a given roadway in a given time period under the prevailing roadway and traffic conditions.

The evaluation of roadway capacity requires consideration of the following:

a. Number of Lanes - can generally be considered as two-lane rural.

b. Lane Width, Lateral Clearance and Shoulders - Requires capacity reduction when certain conditions exist.

c. Auxiliary Lanes - Parking, for example, must be considered as a lateral clearance problem.

d. Surface Condition - At present there is no specific adjustment and judgement will be required.

e. Alignment - is built into other adjustment factors, mainly the volume/capacity ratio.

f. Grades - usually considered under trucks and buses adjustment.

g. Trucks - Is applied as an equivalent passenger car factor.

h. Buses - Is applied in a similar manner as trucks.

i. Lane Distribution - Is generally not a consideration on two-lane roads.

j. Traffic Variations & Interruptions - Consider such things as intersections, driveways, etc. (other conditions will require judgement).

All of the above considerations must be applied to what is called the "ideal condition" for any given desired service level. This basically amounts to taking the ideal condition, at a desired service level, and reducing it downward for existing conditions. As with any variable situation, a lot of judgement, as well as field work, is required.

D. INVENTORY

For purposes of evaluating impact of development, both existing and proposed, existing traffic conditions must be enumerated. The County Road Department maintains traffic count data for the County Road System. This data is based upon the average daily

MARIPOSA COUNTY ROADS - TRAFFIC COUNTS
SUMMERS OF 1973, 1976, and 1979

(MARIPOSA COUNTY ROAD DEPARTMENT DATA)

CO. ROAD #	DESCRIPTION	1973	1976	1979	% CHANGE
105	Allred Rd. @ Hwy. 49	54	61	95	75.9%
105	Allred Rd. @ Hwy. 140			24	N/A
73	Aqua Fria Road @ 49N			55	N/A
73	Aqua Fria Road @ Hwy. 140	37	46	80	116.2%
112	Ashworth Rd. @ Hwy. 49	89	103	160	79.8%
14	Ahwahnee @ Meadow Lane	17	21	26	52.9%
5	Bear Valley Mt. @ Hwy. 49	61	123	190	211.5%
5	Bear Valley Mt. @ Hornitos	173	171	96	-44.5%
8	Ben Hur Rd. @ Hwy. 49	404	592	668	65.3%
8	Ben Hur Rd. @ Preston Rd.	55	45	35	-36.4%
8	Ben Hur Rd. @ Buckeye Rd.	63	77	135	114.3%
135	Boyer Rd. @ Hwy. 49	69	154	125	81.2%
79	Buckeye Rd. @ Ben Hur Rd.	39	87	94	141.0%
79	Buckeye Rd. @ Old Highway	79	73	109	38.0%
2	Buck Meadows Rd. @ Bull Creek Rd.	22	37	52	136.4%
50	Bull Creek Rd. @ Buck Meadows Rd.	81	77	87	7.4%
107	Carlton Rd. @ Triangle Rd.	60	90	160	166.7%
106	Ritchie Rd. @ Triangle Rd.	56	37	57	1.8%
100	Carstens Rd. @ Hwy. 140	16	29	27	68.8%
16	Chowchilla Mt. Rd. @ Hwy. 49	71	224	491	591.5%
1590	Clouds Rest Rd. @ Meadow Lane	75	166	125	66.7%
109	Cole Rd. @ Darrah Rd.	62	217	171	175.8%
98	Colorado Rd. @ Hwy. 140	109	185	230	111.0%
98	Colorado Rd. @ Sherlock Rd.	42	30	61	45.2%
98	Colorado Rd. @ Whitlock Rd.	50	64	33	-34.0%
42	Converse Rd. (Fiske Rd.) @ Greeley Hill Rd.	24	47	37	54.2%
276	Creel Rd. @ Harris Rd.		74	167	N/A
117	Darrah Rd. @ Triangle Rd.	163	207	433	165.6%
117	Darrah Rd. @ Hwy. 49	406	943	1161	186.0%
41	Dexter Rd. @ Fiske Rd.	104	194	177	70.2%
46	Dogtown Rd. @ Holtzel Rd.	66	81	106	60.6%
46	Dogtown Rd. @ Greeley Hill Rd.	27	63	22	18.5%
45	Ernst Rd. @ Holtzel Rd.	152	249	210	36.2%
15	East Westfall Rd. @ Chowchilla Mt. Rd.		55		N/A
15	East Westfall Rd. @ Triangle Rd.	62	145	114	83.9%
158P	Evergreen Lane @ Upper Meadow			15	N/A
158P	Evergreen Dr. @ Meadow Lane	14	5	45	221.4%
158B	Glacier Pt. @ Meadow Lane (North)			31	N/A
158B	Glacier Pt. @ Meadow Lane (South)	13	22	40	207.7%
168	Granite Springs Rd. @ Hwy. 132	42	48	43	2.4%
1	Greeley Hill Rd. @ Hwy. 49	496	800	682	39.5%
1	Greeley Hill Rd. @ Smith Station Rd.	74	99	92	24.3%
129	Harris Cutoff @ Harris Rd.	100	171	213	113.0%
128	Harris Rd. @ Harris Cutoff	95	132	324	241.1%
128	Harris Rd. @ Hwy. 49	30		32	6.7%
	Hidden Valley Rd. @ Silver Bar Rd.	58	79	41	-29.3%
116	Hirsch Rd. @ Hwy. 49	32	120	253	690.6%
116	Hirsch Rd. @ Indian Peak Rd.	24	14	67	179.2%
43	Holtzel Rd. @ Greeley Hill Rd.	287	390	454	58.2%
6	Hornitos Rd. West of Hornitos	275	374	248	-9.8%
53	Hunters Valley Rd. @ Bear Valley Mt. Rd.	21	34	102	385.7%
6	Hornitos Rd. @ Hwy. 140	231	308	213	-7.8%
136	Incline Rd. @ Hwy. 140		15		N/A
60	Indian Gulch Rd. @ Hwy. 140	55	61	78	41.8%
60	Indian Gulch Rd. @ Hornitos Rd.	20	13	15	-25.0%
111	Indian Peak Rd. @ Hwy. 49	352	387	422	19.9%
111	Indian Peak Rd. @ Hirsch Rd.	76	82	115	77.5%
111	Indian Peak Rd. @ Oak Grove Rd.	85	115	208	144.7%
111	Indian Peak Rd. @ Usona Rd.	38	37	43	13.2%
118	Jerseydale Rd. @ Triangle Rd.	113	206	321	184.1%
133A	Leonard Rd. @ Hwy. 49	53	38	92	73.6%

TABLE I

MARIPOSA COUNTY ROADS - TRAFFIC COUNTS
(cont.)

CO. ROAD #	DESCRIPTION	1973	1976	1979	% CHANGE
158A	Meadow Lane @ Clouds Rest Rd.	39	71	48	23.1%
158A	Meadow Lane @ Main Gate	119	199		N/A
158A	Meadow Lane @ Triangle Rd.	89	198	298	234.8%
4	Merced Falls Rd. @ Hwy. 49		126	175	N/A
86	Miller Rd. @ Hwy. 140		105	81	N/A
86	Miller Rd. @ Old Highway			26	N/A
10	Mt. Bullion Cutoff @ Hwy. 140	135	169	244	80.7%
10	Mt. Bullion Cutoff @ Hwy. 49	289	313	381	31.8%
101	Oak Rd. @ Hwy. 140	48	70	107	122.9%
9	Old Highway @ Hwy. 49	260	332	559	115.0%
9	Old Highway @ Yaqui Gulch Rd.	79	89	139	75.9%
9A	Old Highway @ Hwy. 140	62	56	57	-8.1%
9A	Old Highway E. of School House Rd.	46	52	47	2.2%
89	Old Highway @ White Rock Rd.	26	20	36	38.5%
7	Old Toll Rd. @ Hornitos Rd.	45	59	73	62.2%
114	Oak Grove Rd. @ Indian Peak Rd.	58	61	85	46.6%
158N	Pine Top Dr. @ Meadow Lane	20	29	50	150.0%
36	Penon Blanco Rd. @ Old Hwy. 132	32	33	35	9.4%
36	Penon Blanco Rd. @ Hwy. 49		16	29	N/A
100	Ponderosa Way (Carstens Rd.) @ Hwy. 140	120	85	122	1.7%
78	Preston Rd. @ Ben Hur Rd.	19	23	28	47.4%
40	Priest-Coulterville Rd. @ Greeley Hill Rd.	129	132	184	42.6%
158D	Royal Arches @ Meadow Lane			25	N/A
181	Sebastopol Rd. @ Indian Peak Rd.	32	57	98	206.3%
96	Sherlock Rd. @ Whitlock Rd.	26	33	26	0.0%
3	Smith Station Rd. @ Greeley Hill Rd.	190	205	260	36.8%
68	School House Rd. @ Hwy. 140	159	276	211	32.7%
108	Silva Rd. @ Triangle Rd.			94	N/A
108	Silva Rd. @ Hwy. 49	55	123	275	400.0%
81	Silver Bar Rd. @ Ben Hur Rd.	80	139	214	134.0%
155	Stockton Creek Rd. @ Hwy. 49		98	90	N/A
131	Stumpfield Mt. Rd. @ Hwy. 49	17	10	63	270.6%
132	Tip Top Rd. @ Triangle Rd.	99	201	257	159.6%
132	Tip Top Rd. @ Wass Rd.			463	N/A
13	Triangle Rd. @ Hwy. 140	321	344	562	75.1%
13	Triangle Rd. @ Darrah Rd. (west)	131	202	324	147.3%
13	Triangle Rd. @ Darrah Rd. (east)	246	406	713	189.8%
13	Triangle Rd. @ Hwy. 49	120	180	220	83.3%
133	Usona Rd. @ Indian Peak Rd.	33	41	46	39.4%
133	Usona Rd. @ Hwy. 49	137	195	207	51.1%
83	Varain Rd. @ Hwy. 49	118	104	152	28.8%
12	Wass Rd. (Bootjack Rd.) @ Hwy. 49	170	412	320	88.2%
75	White Rock Rd. @ County line	30	26	17	-43.3%
75	White Rock Rd. @ Old Hwy.	17	8	128	652.9%
11A	Whitlock Rd. @ Hwy. 49	30	24	31	3.3%
11	Whitlock Rd. @ Hwy. 140	240	403	352	46.7%
11	Whitlock Rd. @ Sherlock Rd.	26	30	45	73.1%
185	Woodland Dr. @ Hwy. 49	127	48	93	-26.8%
74	Yaqui Gulch (Hogan Rd.) @ Old Highway	44	43	103	134.1%
74	Yaqui Gulch (Hogan Rd.) @ Hwy. 140	47	76	134	185.1%
102	Yosemite Oaks Rd. @ Hwy. 140			8	0.0%
102	Yosemite Oaks Rd. @ Whitlock Rd.	24	53	60	150.0%

TABLE III

MARIPOSA COUNTY - ANNUAL & PEAK MONTH ADT's - 1976 - 1979

CALTRANS Milespost #	Description	1976		1977		1978		1979		% Increase	
		Annual	Pk.Mo.	Annual	Pk.Mo.	Annual	Pk.Mo.	Annual	Pk.Mo.	Annual	Pk.Mo.
	HIGHWAY 140										
00.00	Merced/Mariposa Co. Line	2,600	4,200	2,600	4,200	3,000	4,850	3,000	4,850	15.4%	15.5%
9.50	Hornitos Road	2,600	4,250	2,600	4,250	3,000	4,900	3,000	4,900	15.4%	15.3%
21.22	Jct. Rt. 49 SE	5,000	8,100	5,500	8,900	6,000	9,700	6,000	9,700	20.0%	19.8%
21.38	Mariposa, 6th St.	6,000	9,700	6,000	9,700	6,500	10,500	6,500	10,500	8.3%	8.3%
22.00	Jct. Rt. 49 NW	4,500	7,300	4,500	7,300	5,000	8,100	5,000	8,100	11.1%	11.0%
25.48	Midpines Summit	3,000	4,900	3,000	4,900	3,100	5,100	3,100	5,100	3.3%	4.1%
29.12	Midpines Road	2,000	3,250	2,200	3,600	2,300	3,750	2,300	3,750	15.0%	15.4%
31.54	Milepost Equation	1,600	2,600	2,000	3,250	2,000	3,250	2,000	3,250	25.0%	25.0%
34.07	Briceburg	1,600	2,600	1,800	2,950	1,800	2,950	1,800	2,950	12.5%	13.5%
49.53	Incline	1,600	2,600	1,600	2,600	1,800	2,950	1,800	2,950	12.5%	13.5%
51.80	YNP Boundary	1,600	2,600	1,600	2,600	1,800	2,950	1,800	2,950	12.5%	13.5%
	HIGHWAY 49										
00.33	Madera/Mariposa Co. Line	1,000	1,450	1,100	1,450	1,200	1,550	1,200	1,550	20.0%	6.9%
12.55	Bootjack	1,700	2,350	1,700	2,350	2,000	2,570	2,000	2,570	17.7%	9.4%
15.58	Milepost Equation	2,400	3,250	2,600	3,550	2,700	3,700	2,700	3,700	12.5%	13.9%
16.70	Ben Hur Road	2,800	3,800	3,000	4,050	3,000	4,100	3,000	4,100	7.1%	7.9%
18.50	So. Jct. Rt. 140	3,500	4,750	3,700	5,000	4,500	6,100	4,500	6,100	28.6%	28.4%
18.50	No. Jct. Rt. 140	1,900	2,600	2,000	2,700	2,500	3,400	2,300	3,100	21.1%	19.2%
22.67	Mt. Bullion	900	1,200	1,000	1,350	1,000	1,500	1,000	1,350	11.1%	12.5%
34.99	Milepost Equation	620	840	620	840	650	880	650	880	4.8%	4.8%
45.22	Coulterville	300	400	300	400	300	400	300	400	0.0%	0.0%
49.39	Mariposa/Tuolumne Co. Line	400	540	400	540	400	540	400	540	0.0%	0.0%
	HIGHWAY 132										
00.00	Tuolumne/Mariposa Co. Line	950	1,300	950	1,300	1,000	1,350	1,000	1,350	5.7%	3.9%
18.75	Coulterville, Jct. Rt. 49	550	740	550	740	560	760	560	760	1.8%	2.7%
	HIGHWAY 120										
41.52	Tuolumne/Mariposa Co. Line	1,300	2,550	1,300	2,550	1,800	3,550	1,800	3,550	38.5%	39.2%
43.09	Buck Meadows	1,200	2,350	1,200	2,350	1,800	3,550	1,800	3,550	50.0%	51.1%

traffic (ADT) for the periods counted. Cal-Trans maintains similar data on all state highways in the county. Tables II and III describe ADTs for county roads and state highways respectively.

Mariposa County streets and roads and state highways are heavily impacted by approximately 2.5 million visitors annually. The following tables describe the extent and origin of recreational travel in Mariposa and the gate counts at the four entrances to Yosemite National Park.

TABLE IV

Round Trips Per Year By Recreation Facility and By Rank - CALTRANS Data (1976)

	FACILITY	ROUND TRIPS PER/YR.
1.	Yosemite National Park	669,464
2.	Lake McClure	60,061
	McClure Point	(21,791)
	Barrett Cove	(18,587)
	Horseshoe Bend	(17,763)
	Bagby	(1,664)
	Hunters Valley Point	(256)
3.	Lake McSwain	18,562
4.	Highway 140 - Mariposa to El Portal	11,792
	Indian Flat	(3,155)
	KOA-Midpines	(3,106)
	Cedar Lodge	(1,799)
	Briceburg to Hail Gulch	(1,631)
	Redbud	(1,421)
	Bear Creek Campgrounds	(680)
5.	Sierra National Forest	2,749
	Summit Camp	(1,842)
	Jerseydale Campground	(710)
	Crows Foot Campgrounds	(197)
6.	Buck Meadows Resort	1,834
	Dispersed Area - County-wide	5,010
	TOTAL	769,472

TABLE V

MARIPOSA COUNTY

Recreation Round Trips Per Year By
Area Origin - CALTRANS Data (1977)

AREA ORIGIN	# OF ROUND TRIPS	% OF TOTAL
San Joaquin Valley	105,800	13%
Sacramento Valley	87,900	11%
Los Angeles Area	280,900	34%
Bay Area	234,100	28%
Tahoe	1,700	1%
Out of State		
North	36,100	4%
South	77,100	9%
TOTAL	823,600	100%

TABLE VI

MARIPOSA COUNTY

Annual Recreation ADT as a Percent
of Total Annual ADT - CALTRANS Data

ROUTE	ANNUAL ADT	% ANNUAL REC. ADT
140 at Hornitos Road	2,600	53%
140 at Incline	1,600	84%
140 at El Portal	1,500	74%
120 at Buck Meadows	1,200	75%
132 Co. Line East to Coulterville	900	53%
49 Coulterville North to Co. Line	500	23%

TABLE VII

Recreation ADT by Season - Major Routes (CALTRANS)

ROUTE #	ANNUAL ADT	REC. ADT OFF-SEASON	% REC. ADT OFF-SEASON	REC. ADT SUMMER	% REC. ADT SUMMER
140 at Hornitos Rd.	2,600	338	22%	2,938	71%
140 at Incline	1,600	176	41%	3,584	93%
120 at Buck Meadows	1,200	47	7%	5,053	90%

TABLE VIII

YOSEMITE NATIONAL PARK TRAFFIC COUNTS - 1978-1979

Month	1978 ARCH ROCK Hwy. 140 Vehicles	Visitors	% of Total	1978 SOUTH ENTRANCE Hwy. 41 Vehicles	Visitors	% of Total	1978 BIG OAK FLAT Hwy. 120 Vehicles	Visitors	% of Total	1978 TIOGA PASS Hwy. 120 Vehicles	Visitors	% of Total	1978 Totals Vehicles	Visitors
January	11,869	34,420	37.9%	14,870	43,123	47.4%	4,610	13,369	14.7%	Closed			31,349	90,912
February	11,957	34,675	40.9%	12,377	35,893	42.4%	4,870	14,123	16.7%	Closed			29,204	84,692
March	16,501	47,853	40.6%	15,212	44,115	37.4%	8,965	25,999	22.0%	Closed			40,678	117,966
April	17,537	50,857	38.8%	17,093	49,570	37.8%	10,596	30,728	23.4%	Closed			45,226	131,155
May	30,751	89,178	33.7%	34,882	101,158	38.2%	25,630	74,327	28.1%	Closed			91,263	264,662
June	34,468	99,975	25.0%	46,870	135,923	33.9%	32,512	94,285	23.5%	24,259	70,351	17.6%	138,109	400,516
July	35,226	102,155	21.9%	51,793	150,200	32.2%	37,493	108,729	23.3%	36,288	105,253	22.6%	160,827	466,398
August	34,219	99,235	21.6%	47,685	138,286	30.1%	37,471	108,666	23.6%	39,269	113,800	24.7%	158,644	460,068
September	26,422	76,624	23.9%	31,866	92,411	28.9%	26,591	77,114	24.1%	25,506	73,967	23.1%	110,385	320,117
October	21,381	62,005	26.3%	23,280	67,512	28.6%	21,325	61,764	26.2%	15,369	44,570	18.9%	81,328	235,851
November	14,087	40,852	35.5%	15,225	44,153	38.4%	8,992	26,077	22.6%	1,393	4,040	3.5%	39,697	115,121
December	11,414	33,101	36.2%	14,330	41,557	45.5%	5,778	16,756	18.3%	Closed			31,522	91,414
TOTALS	265,832	770,935	27.7%	325,483	943,901	34.0%	224,835	651,937	23.5%	142,084	411,981	14.8%	958,234	2,778,872

Month	1979 ARCH ROCK Hwy. 140 Vehicles	Visitors	% of Total	1979 SOUTH ENTRANCE Hwy. 41 Vehicles	Visitors	% of Total	1979 BIG OAK FLAT Hwy. 120 Vehicles	Visitors	% of Total	1979 TIOGA PASS Hwy. 120 Vehicles	Visitors	% of Total	1979 Totals Vehicles	Visitors	%Change 1978-79
January	10,581	30,685	39.5%	11,507	33,370	43.0%	4,691	13,604	17.5%	Closed			26,779	77,659	-14.6
February	11,322	32,834	41.9%	10,833	31,416	40.1%	4,872	14,129	18.0%	Closed			27,027	78,379	- 7.5
March	13,572	39,359	39.3%	12,896	37,398	37.4%	8,033	23,296	23.3%	Closed			34,501	100,053	-15.2%
April	18,145	52,621	35.2%	19,770	57,333	38.6%	13,306	38,587	26.2%	Closed			51,221	148,541	+13.3%
May	22,581	65,485	30.9%	23,809	69,046	32.6%	19,389	56,228	26.5%	7,307	21,190	10.0%	73,086	211,949	-19.9%
June	26,726	77,505	24.1%	33,512	97,185	30.2%	30,132	87,383	27.2%	20,527	59,528	18.5%	110,897	321,601	-19.7%
July	28,228	81,861	20.5%	41,544	120,478	30.1%	38,843	112,645	28.1%	29,303	84,979	21.3%	137,918	399,963	-14.2%
August	30,352	88,020	19.4%	46,570	135,053	29.7%	43,827	127,098	28.0%	35,799	103,817	22.9%	156,548	453,988	- 1.3%
September	23,809	69,046	21.5%	32,010	92,829	28.9%	28,898	83,804	26.1%	25,950	75,225	23.5%	110,667	320,904	+ .3%
October	18,985	50,057	26.2%	22,430	65,047	30.8%	20,093	58,270	27.7%	11,094	32,173	15.3%	72,602	205,547	-10.3%
November	12,800	37,120	33.3%	15,764	45,716	41.0%	9,522	27,614	24.8%	372	1,079	.9%	38,458	111,529	- 3.1
December	11,365	32,959	37.1%	12,775	18,954	41.6%	6,536	18,954	21.3%	Closed			30,676	70,867	- 2.7
TOTALS	228,466	657,552	26.3%	283,420	803,825	32.6%	228,142	661,612	26.1%	130,352	377,991	15.0%	870,380	2,500,930	- 9.2

E. FISCAL EVALUATION

1. Costs of Construction and Reconstruction

During fiscal year 1979-80, the County of Mariposa appropriated approximately $388,500 for minor construction and $371,600 for major construction/reconstruction projects. This represented approximately 8.5 to 13 miles of roads overtopped, 2% to 3% of the total county improved system. At this rate of improvement or major maintenance, all county roads will receive this type of major maintenance every 30 to 46 years.

Major construction projects covered approximately 1.5 to 1.9 miles. It normally takes several years at this rate of budgeting to undertake a major road construction or reconstruction project of sufficient scope to be cost effective. At this rate of construction it would take 46 to 58 years to improve the graded dirt roads in the county system alone. It takes 5 to 6 years to accumulate sufficient revenues to reconstruct a 10 mile section of county road. Utilizing a hypothetical 10 mile section of road as an example, assuming that all property tax receipts are used for new construction and not for maintenance at 1979-80 estimated receipts, it would take 11 to 13 years to accumulate sufficient revenues from all county property tax receipts to construct or reconstruct the road. It is obvious from the above examples that construction projects for streets and roads in the county will not be able to keep pace with increased usage (refer to Table II) even if the most intensively used roads are improved, revenues will not approach need.

2. Maintenance Costs

As discussed earlier, total maintenance costs for paved county roads averages around $1,700 per mile. These rather high costs are assumed to be due in part to the inablility of the County to undertake the necessary minor construction necessary thereby increasing the patching needs on the roads and streets. While dirt roads require less maintenance, the volume of traffic this system can handle is limited. Development that results in increased traffic flows on these roads will result in an exceedingly hazardous road system. State funds presently amount to 58.2% of the total revenues required to maintain the county system.

As County roads that are unimproved or merely require annual maintenance grading do not cost $1,251 per mile to maintain, the difference is utilized to maintain the paved county roads with annual maintenance costs in excess of $1,700 per mile. As a higher degree of improvement is required, due to increased usage, on unimproved or non-paved roads, existing maintenance levels will need to be reduced.

TABLE IX

YOSEMITE NATIONAL PARK - PERCENT CHANGE BY ENTRANCE - 1978 to 1979

ENTRANCE	TOTAL VEHICLES 1978	TOTAL VEHICLES 1979	% CHANGE
Arch Rock (Hwy. 140)	265,832	228,466	-14.1%
South Entrance (Hwy. 41)	325,483	283,420	-12.9%
Big Oak Flat (Hwy. 120)	224,835	228,142	+ 1.5%
Tioga Pass (Hwy. 120)	142,084	130,352	- 8.3%
TOTAL	958,234	870,380	- 9.2%

TABLE X

YOSEMITE NATIONAL PARK - BUS AND PASSENGER COUNTS - 1979*

Month	ARCH ROCK Hwy. 140 Busses	ARCH ROCK Hwy. 140 Visitors	% of Total	SOUTH ENTRANCE Hwy. 41 Busses	SOUTH ENTRANCE Hwy. 41 Visitors	% of Total	BIG OAK FLAT Hwy. 120 Busses	BIG OAK FLAT Hwy. 120 Visitors	% of Total	TIOGA PASS Hwy. 120 Busses	TIOGA PASS Hwy. 120 Visitors	% of Total	TOTAL Busses	TOTAL Visitors
August	757	18,888	65.7%	178	6,099	15.5%	76	2,015	6.6%	141	3,705	12.2%	1,152	30,707
September	383	8,383	61.9%	69	2,177	11.2%	66	1,328	10.6%	101	2,726	16.3%	619	14,614
October	307	7,778	60.3%	84	3,291	16.5%	74	1,105	14.6%	44	1,254	8.6%	509	13,428
November	201	4,138	70.8%	62	2,312	21.8%	21	274	7.4%	Closed			284	6,724
December	63	1,112	75.0%	16	617	19.1%	5	43	5.9%	Closed			84	1,772
TOTAL	1,711	40,299	64.6%	409	14,496	15.5%	242	4,765	9.1%	286	7,685	10.8%	2,648	67,245

*Data are available beginning August, 1979.

7.400 FISCAL IMPACT SYSTEM ANALYSIS

7.401 INTRODUCTION

The evaluation of growth and development impacts on the revenue expenditure patterns of a local government is a method by which a local government can be reasonably assured that they can maintain adequate basic service levels in the future. There are numerous methods of evaluating the fiscal impact of growth and development, all of which rely on a economic "model" that approximates the real world. Based upon an evaluation of the various systems or models in use, the system developed by the Cooperative Extension Service and the University of California appears to yield the most accurate picture of Mariposa County's unique fiscal circumstance.

The Cooperative Extension fiscal model utilized a system of assigning costs and revenues to people and property. For purposes of application in Mariposa County, the major heading of "people" has been further refined to reflect the two and one half million tourists who visit Mariposa and the Yosemite Valley annually.

7.402 GOALS AND ASSUMPTIONS

The Cooperative Extension system in Mariposa County accomplishes two specific objectives; 1) provides a basis for evaluating development projects against the County's ability to maintain basic service levels at the 1979-80 level, 2) provide a means where basic governmental management decisions can be evaluated with regards to County income and expenditure. In any system or model there are basic assumptions that must be made. The application of the Cooperative Extension fiscal model in Mariposa County relies on the following assumptions:

A. Basic services are equal to expenditure levels by budget category.

B. Fiscal year 1979-80 is used as a base year for calculating basic service and revenue limits.

C. All expenditure and revenue amounts are calculated in 1979-80 dollars and must be modified for use in future years to reflect inflation.

D. The growth in revenue amounts by source will remain constant in relationship with each other in future years.

E. County policy on areas of expenditure will remain relatively constant in future years.

These assumptions as they apply to the basic Cooperative Extension model are subject to modification.

7.403 METHODOLOGY

The Cooperative Extension model relies on an allocation of government costs and income to property and people. Table 6A contains a summary of the allocation system. This system assigns County Expenditure to property, residents and visitors on the basis of use. The concept of allocation assumes that costs will increase to these sectors in proportion to: 1) increase of property value, 2) increase in residents, and 3) increase in numbers of visitors. The revenue allocations measures the sensitivity of various revenue sources to: 1) increase in property value, 2) increase in residents and 3) increase in numbers of visitors.

Table 6-B describes the 1979-80 County budget ty expenditure and revenue category in addition to the assessed value, population and visitor counts of the County for 1979-80. Based upon these figures and the assumptions described on Table 6-A, the expenditure and revenue allocations described in Table 6-C show the following:

REVENUES/EXPENDITURES
BY SECTOR AS A % OF TOTAL BUDGET
1979-80

A. EXPENDITURES:

Visitors	6.21%
People	82.49%
Property	11.30%

B. REVENUES:

Visitors	27.28%
People	44.48%
Property	28.24%

In summary, the impact of growth and development in the County can be described as follows:

C. Every $100 increase in assessed value in the County will yield an additional net $ 1.429 to the County's revenue.

D. Every person added to the County's population base will result in a net increase of (-)$211.96 in revenue.

E. Every additional visitor to the County will result in an additional $ .517 of net income to the County.

For purposes of analysis, it must be assumed that no development proposal will result in a greater number of visitors coming to the County but may result in an increase of revenues derived from each visitor. This will have to be determined on a case by case basis, however, the bulk of development in the County can be evaluated in relation to its impact on property and resident expenditure/revenues.

TABLE 6-A

REVENUE AND EXPENDITURES ATTRIBUTED TO
PEOPLE AND PROPERTY
IN MARIPOSA COUNTY

Expenditure Categories	Property	People	
		Resident	Visitors
General Government	18%	75%	7%
Public Protection	28%	60%	12%
Public Ways and Facilities	0%	95%	5%
Health and Sanitation	8%	90%	2%
Public Assistance	0%	100%	0%
Education	0%	100%	0%
Recreation and Culture	0%	90%	10%
Revenue Categories			
Tax Receipts			
Property Tax Related	100%	0%	0%
Non-Property Tax Related	0%	20%	80%
Other Revenue			
Lic., Permits & Franchises	0%	100%	0%
Fines, Forfeitures & Penalties	0%	90%	10%
From Use of Money and Property	20%	70%	10%
From Other Government Agencies	20%	75%	5%
Other Revenue	50%	50%	0%
Charges for Current Services	10%	90%	0%

TABLE 6-B

PROPERTY - Total Assessed Value 1979-80	$72,611,901.00	(726,119-Av/$100)
POPULATION - Total Estimated Population 79-80	11,100	People
VISITOR - Yosemite Visitor County 79-80	2,500,000	Visitors

ACTUAL 1979-80

Expenditures:

General Government		$ 1,355,684.45
Public Protection		1,468,581.66
Public Ways & Facilities		1,646,827.18
Health and Sanitation		514,116.90
Public Assistance		944,103.31
Education		54,580.36
Recreation		177,837.60
	Total	$ 6,161,731.46

Revenues:

Tax Receipts		
Property Tax Related		$ 1,125,429
Non-Property Tax Related		1,889,170
Other Revenue		
Lic., Permits & Franchises		148,937
Fines, Forfeitures & Penalties		73,541
From Use of Money and Property		525,046
From Other Government Agencies		2,043,381
Other Revenue		206,412
Charges for Current Services		149,815
	Total	$ 6,161,731

TABLE 6-C

EXPENDITURE/REVENUE ALLOCATIONS
1979-80 Base Year

Expenditure	($/100 Assessed Value) Property	($/Population) People Resident	($/Visitor) Visitors
General Government	$ .336	$91.60	$ .038
Public Protection	.566	79.38	.071
Public Ways and Facilities	0	140.95	.033
Health and Sanitation	.057	41.69	.004
Public Assistance	0	85.05	0
Education	0	4.92	0
Recreation and Culture	0	14.42	.007
Total	$ .959	$458.01	$ .153
Revenues			
Property Tax	$1.517	0	$ 0
Non-Property Tax Related	0	34.04	.605
Lic., Permits & Franchises	0	13.42	0
Fines, Forfeitures & Penalties	0	5.96	.003
From Use of Money and Property	.145	33.11	.021
From Other Government Agencies	.563	138.07	.041
Other Revenue	.142	9.30	0
Charges for Current Services	.021	12.15	0
Total	$2.388	$246.05	$ .670
Difference	$1.429	(-)$211.96	+$ .517

7.404 FISCAL IMPACT ASSESSMENT

As the primary purpose of this study, the Evaluation of Development Impacts can be simply summarized as follows:

1. Existing Development (Specific Project Proposal)

   a. Assessed Value

   b. Resident Population

   c. Revenue to County

2. Proposed Development (Specific Project Proposal)

   a. Potential Assessed Value

   b. Potential Population

   c. Potential Revenue Less Expenditures

For purposes of illustrating this system based upon the Input/Output Model methodology, the following two examples are described:

EXAMPLE I

Theoretical Residential Subdivision Proposal

Assume:

A. 100 Acre Project Site - presently used for grazing
(No improvements)

Present Value $800/Acre	= $80,000.00	Market Value
	$20,000.00	Assessed Value
Present Revenue Yield (Net)		$285.88/year

B. Proposed Residential Subdivision of 20 lots at 5 acres per lot:

Estimated Value $4,000/Acre	= $400,000.00	Market Value
	$100,000.00	Assessed Value

Unimproved Revenue Yield $1,429.00
(Net Proposed versus existing = $1,143.12)

Assume 20 housing units to be constructed at some time in the future at $80,000.00/unit = $1.6 million Market Value
$400,000.00 Assessed Value
Improved Revenue Yield $ 5,716.00
Total Revenue Yield (Improved + Unimproved) $7,145.00

C. Proposed subdivision of 20 housing units with average household of 2.4 people per residence.

48 people at (-)$211.98 per person = (-)$10,175.04

D. Total Project Impact = $ 7,145.00
less 10,175.04
Total (-)$ 3,030.04

If the project were to create unimproved lots for future residential development, the project will need to remain unimproved 2.1 years for every year it is fully improved. That means that if the land was not improved for 5 years, that would amortize the first 2.4 years of the increased costs to the County for the development. After that time the County will lose $3,030.04 annually on the project in 1979-80 dollars. This would most likely be reflected in reduced services.

EXAMPLE II

Theoretical Commercial Development Proposal

Assume:

A. 10 Acres of unimproved land at present Market Value of $150,000
Assessed Value 37,500
Present Revenue Yield (Net) $535.88

B. Proposed Commercial Complex

Assume present land value and $1.6 million in improvements
Total Value (land + Improvements) $1,750,000 Market Value
$ 437,500 Assessed Value

Potential Revenue Yield (Net)	$ 6,251.88
Difference (existing and proposed)	$ 5,716.00

The project would provide an additional $5,716.00 in new net revenues to the County.

6.500 COUNTY WIDE IMPACTS

The above examples utilize theoretical development proposals for the purposes of illustration of the system mechanics. The examples utilize two vastly different development proposals that accentuate the differences between people/property fiscal impacts. Any system that is utilized on a specific project level must take into account cumulative effects. If County policy were to judge the above examples on the concept that individual development projects pay their own way, commercial development would be encouraged to the exclusion of residential development. This approach would ignore the principal that residential and commercial development are related. New employees require housing and to some extent, new commercial development in Mariposa County needs a residential service population. The issue ultimately is balance between residential and non-residential development to maintain basic revenue/expenditure (service) ratios.

To this end, any fiscal impact system must incorporate a formula for evaluating the relationship between various types of development, their revenues and expenditures. Additionally, the issue of "need" must be addressed. The creation of unimproved subdivision lots in excess of potential consumer demand (growth potential) will result in many unimproved lots that are not likely to be improved in the near future. This will create "excess" revenue for a period of time but will ultimately be translated into a revenue drain at some point in the future. Excess residential parcels will also tend to keep the land values relatively low until the demand for these parcels increases. To the same degree, commercial development, dependent on residential growth, will not be viable until such time as the residential population is high enough to support the commercial activity.

The final issue may very well be invalid in Mariposa County due to the high volume of tourists that pass through the county annually. Although commercial activity may not increase the number of visitors, or even increase their relative contribution to the revenue of the County on a per visitor basis, tourism may provide for commercial expansion that would increase County revenues from the standpoint of property related revenues.

On a county-wide basis, a development impact system should monitor types of development (Residential vs. Commercial) in light of existing development.

8.200 NOISE ELEMENT APPENDIX

The roadway noise levels identified in this section of the appendix were derived from the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108). Mariposa County's major traffic generators are the various state highways which traverse the County. The contours developed here are only for these state highways, and county roads are covered in the proceeding section.

The contour levels were derived using peak ADT and peak hour traffic from the 1980 traffic volume report from the California Department of Transportation. Traffic figures were broken down into hourly figures which reflected greater daytime traffic. It was assumed that truck traffic accounted for 5% of the traffic volumes, with 3% medium trucks and 2% heavy trucks (a breakdown of trucks into medium and heavy was required due to the difference in reference energy mean emission levels). Because of the low traffic volumes on the state highways (peak hour ADT went from a low of 60 to a high of 980) the breakdown of hourly traffic and truck traffic has very little outcome on the resulting L_{dn} values presented here.

The L_{dn} values presented here on 5dba contours were not determined for distances closer than 30 feet since setbacks and reason would typically preclude development within this range. In addition, distances closer than 30 feet would produce more questionable since various other factors, such as shielding, will affect an L_{dn} values derived. For all distances shown in this section for 30 feet, and there are no exceptions, the L_{dn} value was actually less than that identified. As an example, on Highway 140 at 6th Street the 30 ft. distance L_{dn} was 64.00; and on Highway 120 the 30 ft. distance L_{dn} was really 63.05.

Mariposa RTP ADTs

Highway	LOCATION	
140	County Line to Hornitos Road	Peak ADT: 4900 Peak Hr: 480 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 75 70 65 60 Distance, in feet: - - 50 100	
140	Hornitos Road to Junction Highway 49 South	Peak ADT: 4900 Peak Hr: 480 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 75 70 65 60 Distance, in feet: - - 50 100	
140	Junction of Highway 49 South to 6th Street	Peak ADT: 9700 Peak Hr: 910 Avg. Speed: 35 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 80	
140	6th Street to Junction Highway 49 North	Peak ADT: 10,500 Peak Hr: 980 Avg. Speed: 35 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 80	
140	Highway 49 to Midpines Road	Peak ADT: 5100 Peak Hr: 530 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 60	
140	Midpines Road to Briceburg/Bullcreek Road	Peak ADT: 3750 Peak Hr: 410 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 80	

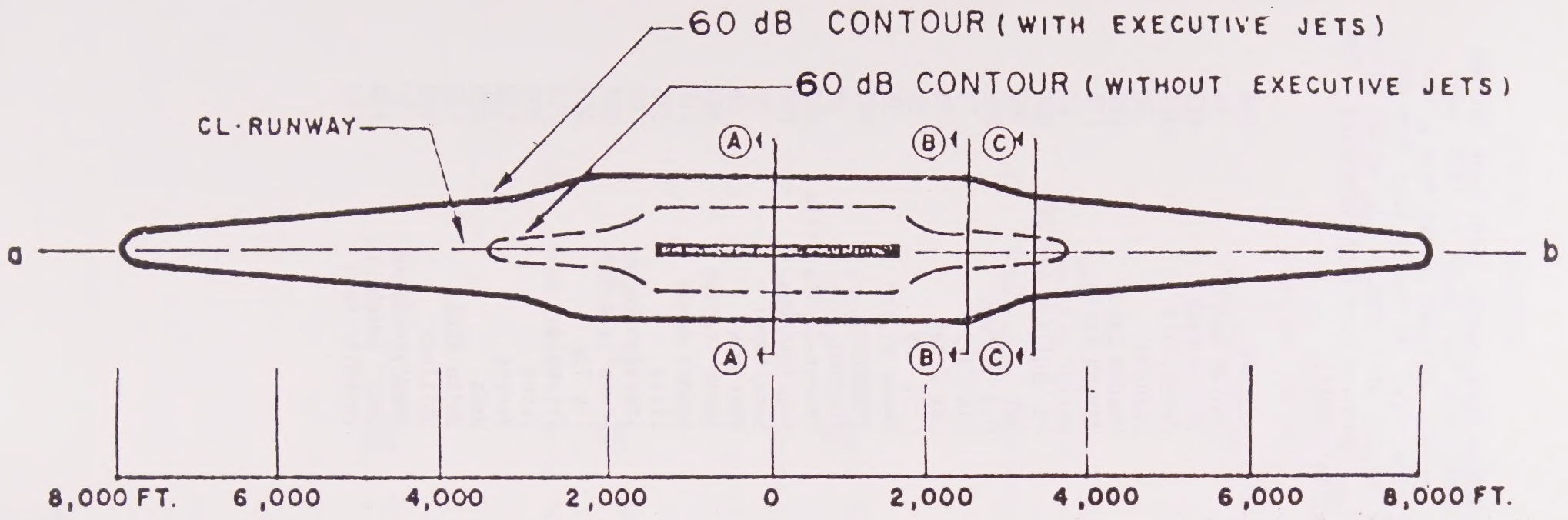
Highway	LOCATION	
140	Briceburg/Bullcreek Road to Incline	
		Peak ADT: 2950 Peak Hr: 360 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 60	
140	Incline to Yosemite National Park Boundary	
		Peak ADT: 2950 Peak Hr: 360 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 60	
49	County Line to Bootjack Road	
		Peak ADT: 1550 Peak Hr: 240 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - - 30	
49	Bootjack Road to Ben Hur Road	
		Peak ADT: 3850 Peak Hr: 360 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 75	
49	Ben Hur Road to Junction Highway 140	
		Peak ADT: 4850 Peak Hr: 470 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 100	
49	Junction Highway 140 to Mt. Bullion	
		Peak ADT: 3250 Peak Hr: 340 Avg. Speed: 55 mph
	Contour Lines L_{dn}: 70 65 60 Distance, in feet: - 30 70	

Highway	LOCATION				
49	Mt. Bullion to Coulterville Junction Highway 132				
					Peak ADT: 950 Peak Hr: 120 Avg. Speed: 55 mph
	Contour Lines L_{dn}:	70	65	60	
	Distance, in feet:	-	-	30	
49	Junction Highway 132 to the County Line				
					Peak ADT: 610 Peak Hr: 75 Avg. Speed: 55 mph
	Contour Lines L_{dn}:	70	65	60	
	Distance, in feet:	-	-	30	
132	County Line to Highway 49				
					Peak ADT: 1350 Peak Hr: 200 Avg. Speed: 55 mph
	Contour Lines L_{dn}:	70	65	60	
	Distance, in feet:	-	-	30	
132	Highway 49 to County Line				
					Peak ADT: 950 Peak Hr: 140 Avg. Speed: 55 mph
	Contour Lines L_{dn}:	70	65	60	
	Distance, in feet:	-	-	30	
120	From County Line to County Line				
					Peak ADT: 3150 Peak Hr: 320 Avg. Speed: 55 mph
	Contour Lines L_{dn}:	70	65	60	
	Distance, in feet:	-	30	70	

County Roads

While State Highways have low traffic volumes, most County Roads have volumes which are considerably lower. Traffic counts were last taken in 1979, and will again be taken in 1982 (on a 3 year cycle). Volumes ranged from a low of 26 cars per day, to a high ot 1161 cars per day. As can be seen from the preceeding data on State Highways, these volumes will produce L_{dn} values below 60 dBA at 30 feet. For this reason, no L_{dn} contours have been developed. The following is a list of County Roads with their ADT's.

Allred	98	Incline	184
Agua Fria	80	Indian Gulch	78
Ashworth	160	Indian Peak	422
Ahwahnee	26	Jerseydale	321
Bear Valley	190	Leonard	92
Ben Hur	668	Meadow Lane	298
Boyer	125	Merced Falls	175
Buckeye	109	Miller	81
Buck Meadows	52	Mt. Bullion Cut Off	381
Bull Creek	87	Oak	107
Carlton	166	Old Highway	559
Carter/Ritchie	57	Old Toll	73
Carstens	27	Oak Grove	85
Chowchilla Mtn.	491	Pine Top	50
Clouds Rest	125	Penon Blanco	35
Cole	171	Ponderosa	122
Colorado	230	Preston	28
Converse	37	Priest-Coulterville	184
Creel	167	Royal Arches	184
Darrah	1161	Sebastopol	98
Dexter	177	Sherlock	26
Dogtown	106	Smith Station	260
Ernst	210	School House	211
East Westfall	114	Silva	275
Evergreen	45	Stockton Creek	90
Glacier Pt.	40	Stumpfield Mtn.	257
Granite Springs	43	Tip Top	463
Greeley Hill	682	Triangle	713
Harris	324	Usona	207
Hidden Valley	41	Varain	152
Hirsch	253	Wass	320
Holtzel	454	White Rock	128
Hornitos	248	Whitlock	352
Hunters Valley	102	Woodland Drive	93
Hornitos	213	Yaqui Gulch	134
		Yosemite Oaks	60



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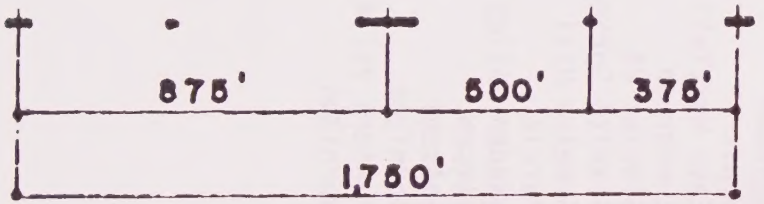

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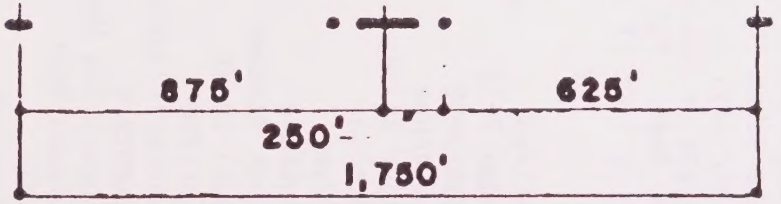

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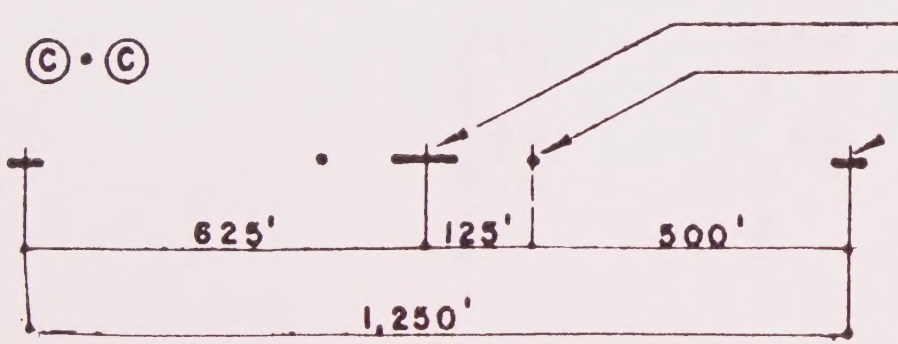

NOTE: ESTIMATE ONLY, DISTANCES SHOWN ARE APPROXIMATE.